

Institutional Health Management Strategies in Women's Empowerment and Child Protection Organizations in Indonesia: A Soft Systems Methodology Approach Using the Pentahelix Framework

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Abstract

Women's empowerment and child protection institutions in Indonesia face complex socio-economic challenges that place a long-term burden on the national health management system. Child marriage has become a major focus of public policy in Indonesia due to its long-term negative consequences for married girls, impacting their health, education, and future career opportunities. The prevalence of child marriage in Indonesia remains at 10.82%, placing 20 of 38 provinces above the national average. This study examines one of the 20 provinces with high rates of child marriage. This study aims to improve institutional health management strategies within women's empowerment and child protection organizations in Indonesia. This study adopted the Soft Systems Methodology (SSM) consisting of seven procedures. Data collection used the Delphi method with a Pentahelix model framework involving government, doctors, psychologists, judges, and religious leaders. The results show that the SSM procedure provides valuable insights for practitioners and policymakers in designing more effective and data-driven intervention programs to reduce the socio-economic impact of child marriage in Indonesia. The Pentahelix expert panel consensus reached an average of 82.3%, identifying Five critical grip areas that require immediate systemic change in institutional health management.

Keywords

Institutional health management, Child marriage, Soft Systems Methodology (SSM), Pentahelix, women's empowerment, child protection, Indonesia

1. Introduction

Women's empowerment and child protection are two interrelated national priorities within the framework of Indonesia's social development. The Ministry of Women's Empowerment and Child Protection (KemenPPPA),

established in 1978, is institutionally responsible for ensuring the rights and well-being of women and children throughout Indonesia (KemenPPPA, 2024). However, implementing agencies at the regional level still face complex systemic challenges, particularly in institutional health management, which is closely linked to the socioeconomic issues of the community.

Child marriage has become one of the most significant issues in Indonesian public policy. The prevalence of child marriage remains at 10.82%, and 20 out of 38 provinces still exceed the national average (Hidayah et al., 2024). This places Indonesia second in Southeast Asia in terms of the number of child marriages, a figure that has risen further during the COVID-19 pandemic (Tandfonline, 2024). More than 1.2 million women aged 20–24 were recorded as having married for the first time before reaching the age of 18 (Nur et al., 2024).

The long-term impacts of child marriage are multifaceted. Women who marry before the age of 18 (13.8%) are more likely to live in poverty than those who marry after the age of 18 (10.1%), and teenage pregnancy is directly correlated with maternal mortality and morbidity rates (PMC, 2021). Child marriage has also been shown to result in lower educational attainment, lower income, and reduced participation in household decision-making (Cameron et al., 2023). In rural areas of Indonesia, adolescent girls at the elementary school level are 448.9 times more likely to experience early marriage than those who have attended college (BMC Public Health, 2024).

Although the rate of child marriage has decreased by 3.5 percentage points over the past decade, this decline remains too slow to meet the targets of 8.74 percent by 2024 and 6.94 percent by 2030 (UNICEF Indonesia, 2023). This situation calls for a more innovative and systems-based approach to institutional health management, one capable of addressing the complexity of the issue holistically.

1.1 Research Objective

This study aims to: (1) identify the main challenges in institutional health management within women's empowerment and child protection organizations in Indonesia; (2) apply the Soft Systems Methodology (SSM) to develop a comprehensive conceptual model for improving institutional health management; (3) integrate the Pentahelix framework through the Delphi method to achieve multi-stakeholder consensus on necessary systemic changes; and (4) formulate evidence-based intervention recommendations for practitioners and policymakers to mitigate the socioeconomic impacts of child marriage in Indonesia.

2. Literature Review

The Soft Systems Methodology (SSM), developed by Checkland and Scholes (1999), holds great potential for policymakers and managers in complex health organizations, as it enables a comprehensive approach to problem situations, the identification of critical issues, and the achievement of a shared understanding of various perspectives as a foundation for improvement. SSM has proven relevant for unstructured public health problems, as demonstrated in the management of stunting in Indonesia, where the use of rich pictures and CATWOE-based root cause analysis was able to reveal various stakeholder perspectives and demonstrate that health issues are multidimensional problems shaped by fragmented information flows and weak inter-organizational coordination (IJOBAS, 2025).

The Pentahelix model, which involves the government, academia, the business sector, communities, and the media as collaborative actors, is increasingly being applied in the policy context in Indonesia. The Ministry of Women's Empowerment and Child Protection (KemenPPPA) has emphatically stated that child protection issues cannot be resolved by a single institution alone, but rather require multi-stakeholder synergy (Susianawati, 2022). Research on the implementation of Pentahelix collaboration in child protection across various provinces in Indonesia confirms that multi-stakeholder engagement yields more sustainable and socially acceptable solutions (IJERE, 2025).

Child marriage in Indonesia is influenced by the interplay of factors such as knowledge, economics, education, culture, law, and the environment (Nur et al., 2024). Although the 2019 revision of the Marriage Law raised the minimum marriage age for girls from 16 to 19 years, challenges in law enforcement at the local level persist, and authorities are struggling despite facing obstacles (Hidayah et al., 2024). The Indonesian Family Life Survey (IFLS) indicates that child marriage is correlated with lower educational attainment, lower income, and higher child mortality rates (Cameron et al., 2023).

The integration of SSM with stakeholder-based methods such as the Delphi technique is an increasingly popular approach in health management research. Pudjono (2026) demonstrates that SSM successfully identified significant

gaps in public sector performance management in Indonesia, including inadequate performance indicators and ineffective system integration. Similarly, research using SSM in the UK National Health Service confirms its value in enabling performance improvement and organizational change (ResearchGate, 2020).

3. Methodology

This study employs an exploratory qualitative research design grounded in Soft Systems Methodology (SSM) as its primary methodological framework. SSM was chosen for its ability to address “soft” (ill-structured) problems—that is, issues involving human values, diverse perspectives, and complex social contexts (Checkland & Scholes, 1999). The challenges of institutional health management in women’s empowerment and child protection organizations are typical soft problems that cannot be adequately resolved through a hard systems approach alone.

The study followed the seven stages of the SSM, as illustrated in Figure 1. In parallel with the SSM stages, data collection was conducted using the Delphi method within the Pentahelix framework. The Delphi method was chosen for its ability to consolidate expert assessments from various disciplines regarding complex issues (Dalkey & Helmer, 1963). The expert panel was purposefully assembled based on the five components of the Pentahelix: (1) Government officials from the Ministry of Women’s Empowerment and Child Protection (KemenPPPA), Regional Health Offices, and the Ministry of Religious Affairs; (2) Physicians specialists (Sp. OG, Sp. A) and community health center doctors; (3) Psychologists clinical psychologists and child psychologists; (4) Judges judges from Religious Courts; and (5) Religious Leaders from various religious backgrounds.

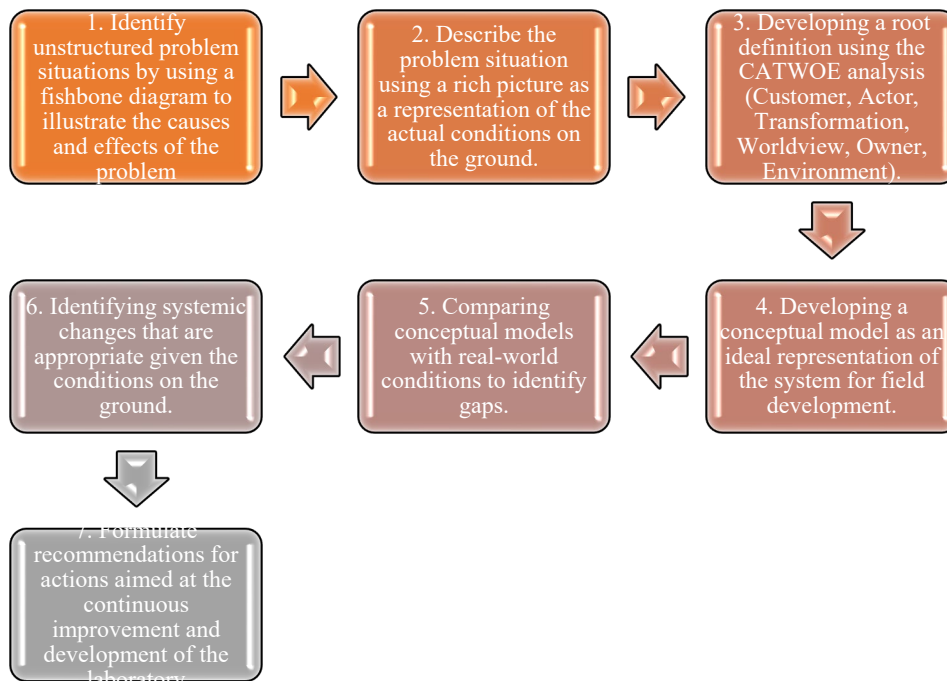


Figure 1. Software System Methodology Procedure (SSM)

The Delphi process was conducted in three rounds. The first round consisted of semi-structured interviews and an open-ended questionnaire to identify key challenges in institutional healthcare management. The second round involved feedback and reassessment of the aggregated results of the first round using a Likert scale of 1–5. The third round aimed to reach a final consensus with a threshold of $\geq 75\%$ agreement among the total expert respondents. Data analysis was conducted through thematic analysis for qualitative interview data, and median with interquartile range (IQR) for quantitative Delphi data. The SSM conceptual model was validated through Focus Group Discussions (FGDs) with representatives of Pentahelix stakeholders.

4. Data Collection

Primary data were collected through direct observation at a DP3A institution in one Indonesian province, in-depth interviews with members of the Pentahelix expert panel, and three rounds of a structured Delphi questionnaire. Secondary data included institutional profiles, organizational structures, policy documents, national child marriage prevalence statistics from BPS and UNICEF Indonesia, and peer-reviewed literature on the application of SSM in the context of health management.

The observations focused on four key dimensions of institutional health management: (a) existing health service protocols and standard operating procedures (SOP); (b) interagency coordination mechanisms; (c) human resource capacity and the composition of multidisciplinary teams; and (d) health information systems and data management infrastructure. A rich picture diagram was developed to visually represent the complex interrelationships among the identified factors, actors, and systemic constraints.

5. Results and Discussion

5.1 Unstructured Problem Situation (SSM Phase 1 — Fishbone Diagram)

An analysis of the fishbone (Ishikawa) diagram identified five main causal categories contributing to suboptimal institutional health management at DP3A agencies in Indonesia. In the Methods dimension, the absence of strategic planning and standardized health management SOPs resulted in inconsistent and inefficient service delivery. In the Environmental dimension, limited physical space and inadequate integrated service facilities hinder the provision of comprehensive services. In the Human dimension, a shortage of multidisciplinary specialists—particularly trained psychologists and counselors—significantly weakens service quality. In the Material dimension, the lack of adequate assessment instruments and health screening tools hinders comprehensive case evaluation. In the Regulatory dimension, inconsistencies in the implementation of child protection regulations at the local level and the absence of integrated cross-sectoral coordination mechanisms constitute the most significant structural barriers (Figure 2).

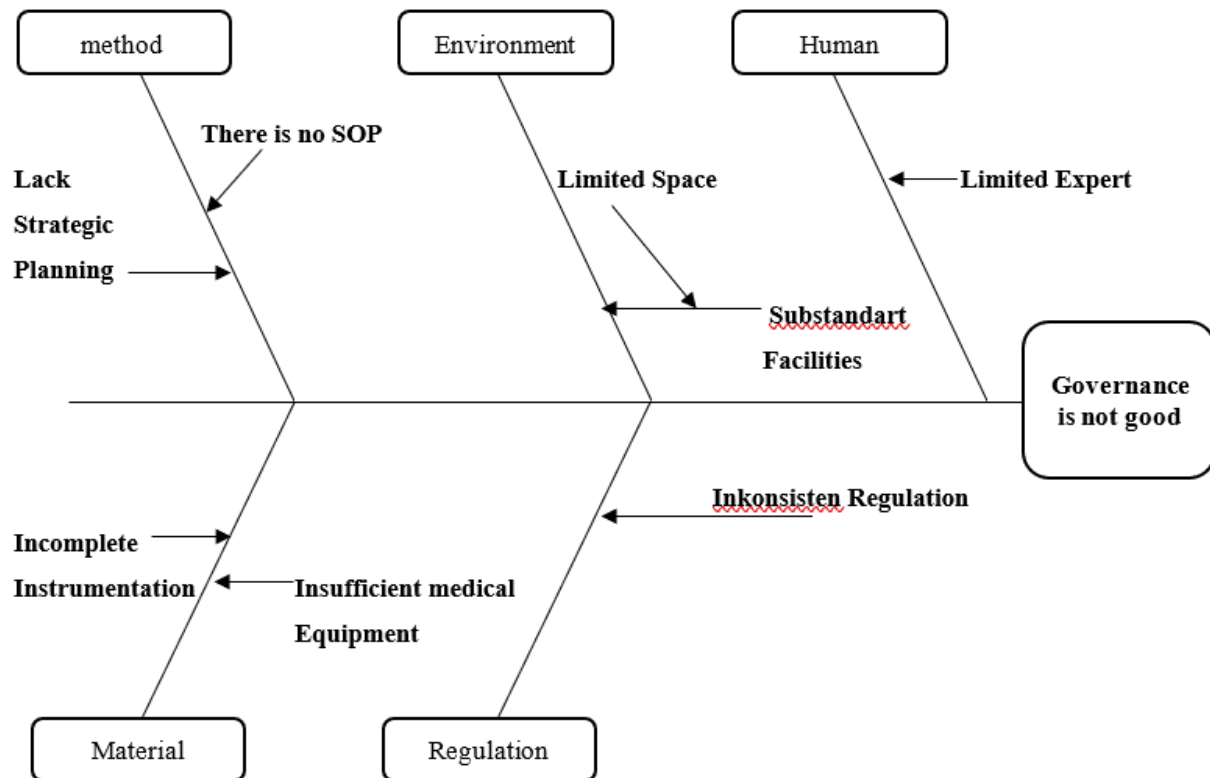


Figure 2. Fishbone Diagram: Unstructure Problem Situations

5.2 Rich Picture (Phase SSM 2)

The rich picture, developed from observational data and interviews, visually represents the complex system of actors, relationships, conflicts, and information flows that influence child marriage and its implications for health management in Indonesia. The key systemic interactions identified include: the relationship between poverty and the risk of child marriage; the role of religious and community norms in decision-making; the gap between national policy mandates and implementation capacity at the local level; and the fragmentation of health services across uncoordinated institutions (Figure 3).

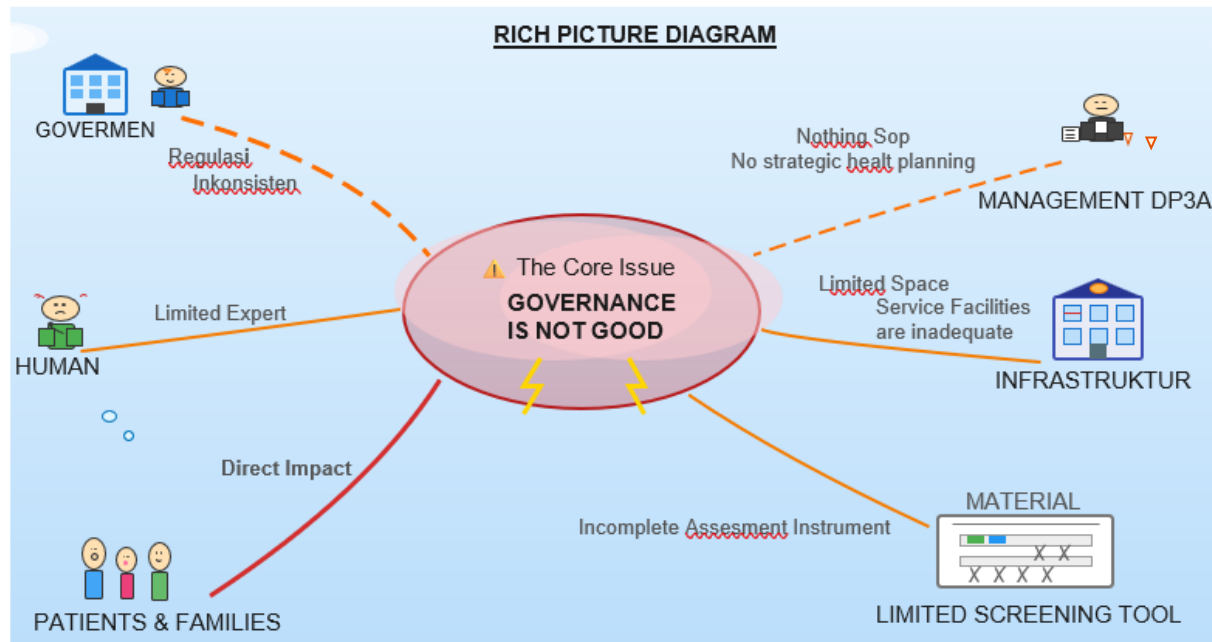


Figure 3. Rich Picture Diagram: Problem Situation Describe

5.3 Root Definition (Phase SSM 3)

A Root Definition (RD) is a statement that transforms a problematic situation in the real world into the essence of the situation as it pertains to a system. This concept is crucial because it serves as a critical point that triggers change. Root definitions are essential for formulating the necessary actions. Through a logical approach, root definitions focus on fulfilling the functions of the CATWOE elements as a control mechanism to ensure appropriate transformation steps. Drafting must be done repeatedly so that CATWOE (*Customer, Actor, Transformation, World, Owner, and Environment*) can be effectively applied.

The CATWOE analysis conducted in collaboration with the Pentahelix expert panel yielded the following root definition: “A system managed by the DP3A agency together with Pentahelix stakeholders to transform the vulnerability of girls resulting from early marriage into optimal health, education, and well-being, while taking into account religious, legal, and local cultural values in Indonesia.” Table 1 presents the complete results of the CATWOE analysis.

Tabel 1. Root Definitions According to the CATWOE Elements

Elemen CATWOE	Description	Research Context
Customer (C)	The group that has benefited the most from the transformation	Girls at risk of or who are victims of early marriage, as well as families and communities in need of health-based child protection services
Actor (A)	Parties that can take action	The DP3A Agency, doctors (Sp. OG, Sp. A), psychologists, judges of the Religious Court, religious leaders, and local government officials
Transformation (T)	The transformation that occurs when the system is put into practice in the real world	Transforming fragmented institutional health management systems into integrated, evidence-based systems to address the impacts of child marriage
World View (W)	A worldview that makes transformation meaningful	Child protection is a collective responsibility that must take into account religious, legal, and health values in a synergistic manner within the Pentahelix framework
Owner (O)	Parties that can halt the transformation	The Ministry of Women's Empowerment and Child Protection, the Ministry of Health, and local governments as the owners and custodians of the system
Environment (E)	External issues with the system	Budget constraints, cultural diversity, human resource capacity at the local level, and inconsistencies in the implementation of regulations

The next step is to define the transformation goal (T), which is formulated using the PQR formula. This formula means that (p) is achieved through (q) to reach (r). If (r) is the Office of Women's Empowerment and Child Protection (DP3A), as the goal, then (q) encompasses the various actions that must be taken to achieve it, while (p) represents the performance improvement indicators of the DP3A.

The transformation process is evaluated using the 3E criteria: efficacy (whether the actions support the achievement of the final outcomes), efficiency (whether resource utilization is optimal), and effectiveness (whether the transformation supports long-term goals). These three criteria serve as a guide for developing a conceptual model in the next phase (Table 2).

Tabel 2. PQR

Efficacy	Efficiency	Effectiveness	Transformation
Early Detection Screening for Children at Risk of Early Marriage	Community-based identification of at-risk children	Assessment of Physical, Psychological, and Social Conditions	Assessment data, Comprehensive Health Profile
Health Interventions	Therapy, Counseling, Medical and Psychosocial Rehabilitation	Pentahelix Coordination: Synergy Among Government, Academia, the Media, and the Community	Integrated Services, Multisectoral Interventions
Human Resource Development, Community Empowerment	Making Optimal Use of Resources	Training for Psychologists and Counselors, as well as Family and Community Education	High-quality human resources

Policy Advocacy, Strengthening Child Protection Regulations	Optimizing Regulations for Child Protection	Strengthening Child Protection Regulations	High-quality systems and robust policies
Monitoring & Evaluation	The entire process makes optimal use of resources	Systematic Measurement Using Quantifiable Indicators	High-quality services, evidence-based marriage programs, improved child well- being, and a sustainable system

5.3 Conceptual Model (Phase SSM 4)

The conceptual model identifies five key activities required for an integrated institutional health management system: (1) Integrated health screening protocols for the early detection of child marriage cases and their health impacts; (2) Structured and scheduled Pentahelix cross-sectoral coordination; (3) An integrated health information system connecting all stakeholders (4) Adequate multidisciplinary human resource capacity (psychologists, counselors, trained health workers) (5) Clear, integrated referral mechanisms between institutions and health facilities. Figure 4 presents the conceptual model developed from the SSM root definition.

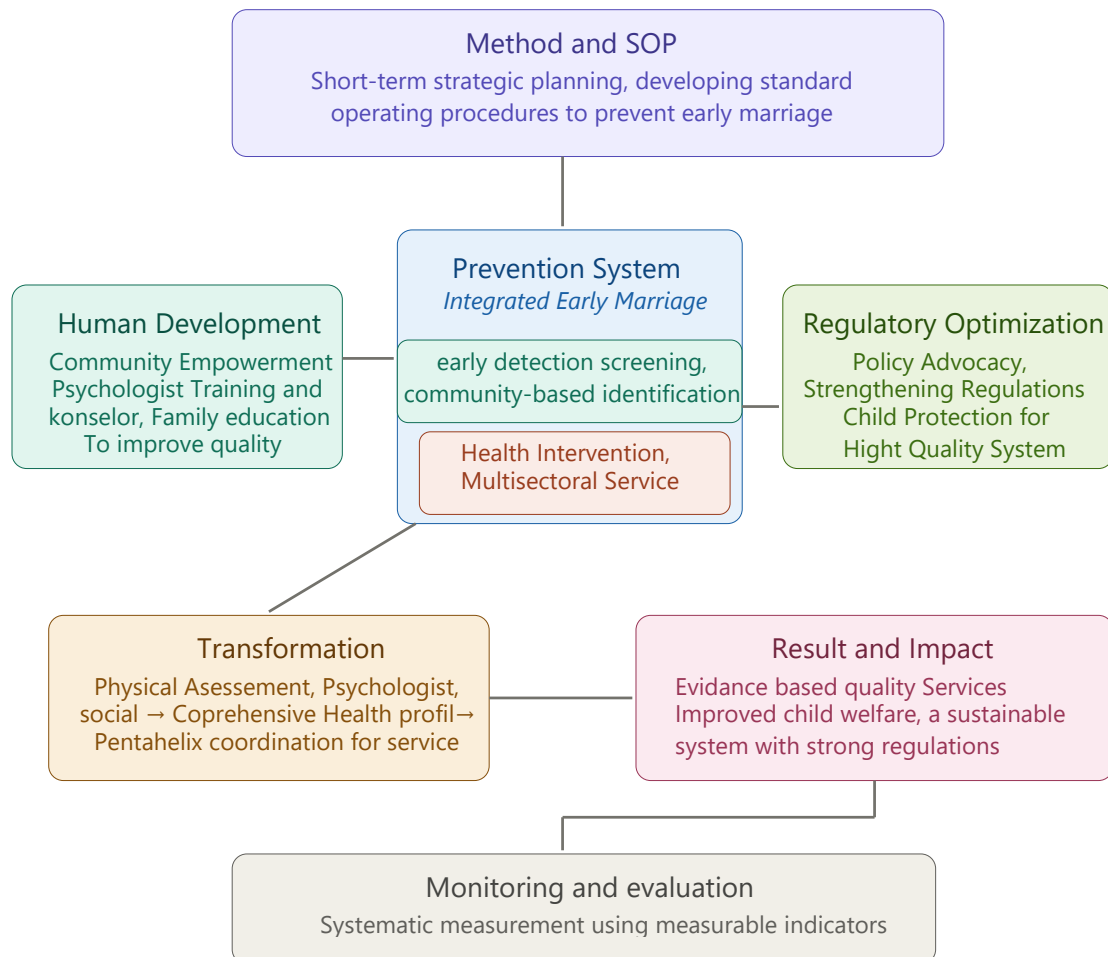


Figure 4. Conceptual Model of Institutional Health Management

5.4 Comparison: Conceptual Model vs. Real-World Conditions (Phase SSM 5)

A comparison of the conceptual model with actual conditions in the field, conducted through the second and third rounds of the Delphi method, revealed five critical gaps that require immediate systemic changes. The consensus among the Pentahelix expert panel reached an average of 82.3% (IQR: 0.5–1.0), exceeding the established threshold (Table 3).

Tabel 3. Comparison Between Conceptual Models and the Real World

Conceptual Models	Reality	Current Situation (Required Actions)
Integrated health screening protocol for the early detection of child marriage cases and their health impacts	Standard protocols are not yet in place at 73% of DP3A agencies; responses remain reactive	Developing a comprehensive health screening SOP as a guide for all service staff
Structured and scheduled cross-sectoral Pentahelix coordination	Coordination is ad hoc and unscheduled; there is no mechanism for regular intersectoral meetings	Establishing regular Pentahelix coordination forums with structured agendas and minutes
An integrated health information system that connects all stakeholders	Data is scattered across various systems that are not connected to one another	Developing a web-based integrated data platform for cross-sectoral case monitoring
Adequate multidisciplinary staff (psychologists, counselors, trained healthcare professionals)	Limited availability of trained psychologists and counselors in rural areas; high staff turnover	Conducting training and recruiting competent multidisciplinary experts
Clearly defined and structured integrated referral mechanisms among various healthcare institutions and facilities	The referral process is unclear, and there is often duplication of services across agencies	Developing standard referral procedures and integrating the referral information system

5.5 Meaningful and Desired Change — The System Thinking Model (Phase SSM 6)

Based on a comparative analysis, five categories of change that are systemically viable and organizationally desirable were successfully identified. The system thinking model presented in Figure 5 integrates these categories of change into a cohesive strategic framework for the development of institutional health management at DP3A, organized according to the five dimensions of the Pentahelix model (Figure 5).

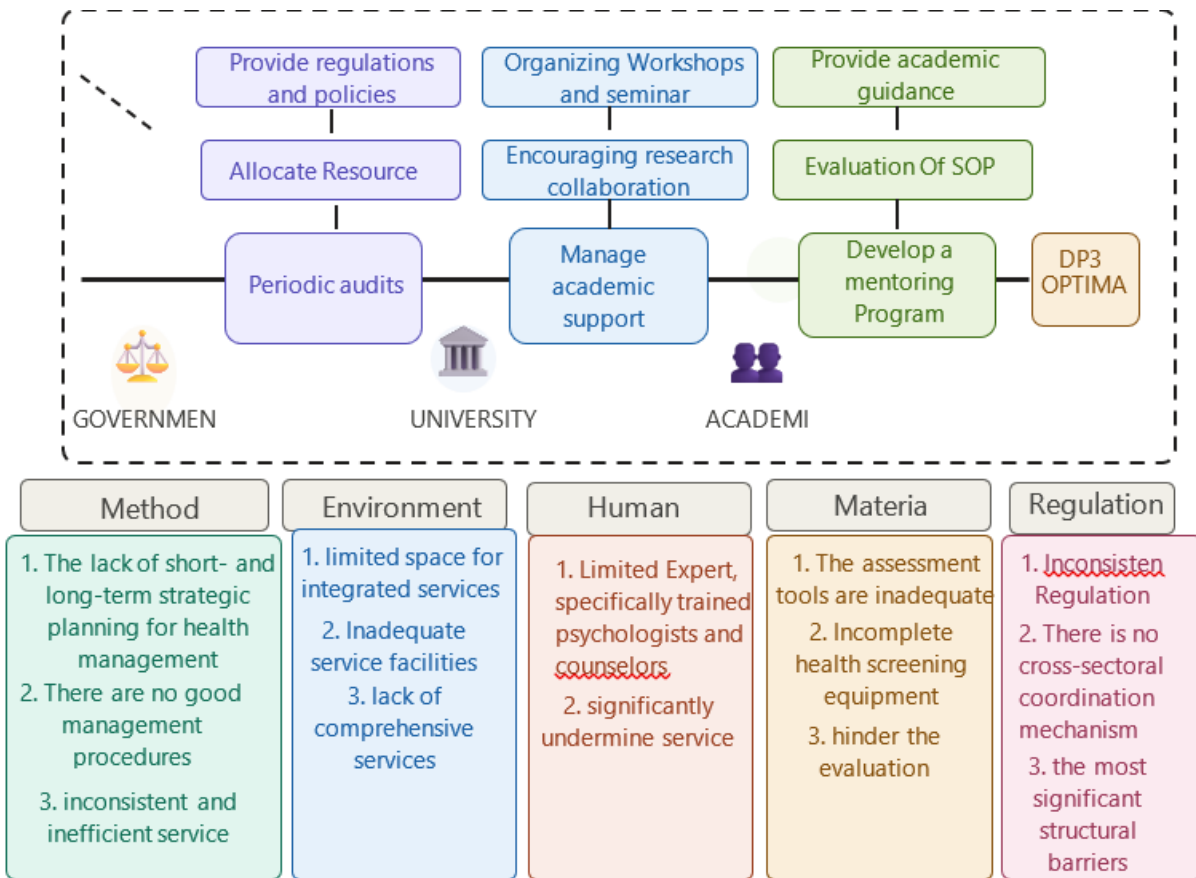


Figure 5. Model System Thinking

5.6 Recommended Action (Phase SSM 7)

The recommended actions presented in Table 3 outline targeted interventions for each Pentahelix actor, ensuring that the proposed changes are systemically integrated and aimed at improving long-term institutional health management. These recommendations emerged from the final Delphi consensus round and have been validated through focus group discussion (FGD) sessions with experts (Table 4).

Table 4. Recommendations for Institutional Health Management Development by DP3A

Subject	Recommended Action
Government (KemenPPPA & Daerah)	- Developing regulations and policies to support the health management operations of the DP3A agency - Establishing a budget based on data on the prevalence of child marriage - Conducting periodic audits and evaluations of compliance with child protection service standards
Minister of Health	- Providing a multidisciplinary healthcare team (doctors, psychologists, counselors) - Conducting training sessions and workshops on the health impacts of child marriage - Promoting inter-agency collaboration on health research
Academics & Researchers	- Developing standard operating procedures (SOP) and evidence-based intervention models for the DP3A agency - Providing technical and methodological guidance to practitioners - Developing mentoring programs and human resource capacity-building initiatives

Religious leader & judge	Promoting awareness of the negative impacts of child marriage within religious communities Providing legal and religious perspectives in policy advocacy programs Collaborating on a community-based approach to preventing child marriage Tightening the Requirements for Marriage Dispensation (Based on Eligibility Criteria)
Womens empowerment and child protection agency (DP3A)	Apply an integrated institutional health management system based on the SSM-Pentahelix model Systematically managing case data to support evidence-based decision-making Developing standard operating procedures (SOPs) for all child protection services Conduct regular coordination with all Pentahelix stakeholders Assessment of children who have received a marriage exemption letter

The SSM-Pentahelix framework indicates that the success of institutional health management transformation within child protection organizations requires simultaneous action across all five dimensions of the Pentahelix. The government must provide an evidence-based regulatory and budgetary foundation; health professionals must contribute in clinical and multidisciplinary capacities; academics must provide methodological rigor and generate evidence; religious leaders and judges must bridge the cultural and legal dimensions; and the DP3A agency itself must operationalize an integrated system through standardized protocols, coordinated data management, and sustained stakeholder engagement.

6. Conclusion

This study successfully demonstrated that the application of Soft Systems Methodology (SSM), integrated with the Pentahelix framework through the Delphi method, is an effective approach for improving institutional health management strategies in organizations dedicated to women's empowerment and child protection in Indonesia.

The seven SSM procedures yielded: (1) a comprehensive problem situation map, revealing five main causal categories of institutional health management deficiencies; (2) a rich picture illustrating complex actor relationships and systemic constraints; (3) a CATWOE-based root cause definition establishing the system's transformational goals; (4) a conceptual model with eight key integrated health management activities; (5) the identification of five critical gap areas through a comparison of the model with reality; (6) a system thinking model for feasible and desirable systemic change; and (7) targeted action recommendations for all five Pentahelix actors with an average expert consensus of 82.3%.

The main contribution of this study is a comprehensive, systemic, and context-sensitive institutional health management framework designed to address the impacts of child marriage in Indonesia. This framework integrates health, legal, psychological, religious, and governance perspectives into a single model that can be implemented by DP3A agencies throughout Indonesia.

Further research is recommended to: (1) validate the proposed model through pilot implementation at selected DP3A agencies; (2) develop standardized, measurable performance indicators for each activity within the model; and (3) evaluate the impact of SSM-Pentahelix-based intervention programs on the prevalence of child marriage and the health status of girls in various regions of Indonesia.

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