❏   46

System Thinking Scales and Learning Environment of Family Planning Field Workers in East Java, Indonesia

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Article Info	ABSTRACT
	Systems thinking is needed due to the growing complexity of the problems faced family planning field workers in the external environment that is constantly changing. System thinking ability could not be separated from efforts to develop learning for the workers, both learning at the individual, group, or organization level. The design of the study was quantitative study using cross-sectional study. There is a relationship between the scale of field worker's system thinking with the learning environment at organization level (p 0.017 $<\alpha$). The characteristic factors; individual, team/group learning environment; are unrelated to the system thinking scales. There are also relationship among learning environments. Individuals learning on systems thinking for field workers are highly needed as a basic capital in the development of human resources. The training/learning done so far needs to be revitalized, that is reconstructing the learning materials or modules taught so as learning can be run more effectively and leads to increase the ability of systems thinking. Organizationrelated to the implementation of field worker tasks lies in the central, provincial and districts/municipalities level, need to facilitate the learning; both at the individual, group/team, and organizational level itself. Learning and guidance need to be developed into a useful integrated mechanism, not only for individuals but also for the organization.

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1. INTRODUCTION

The implementation of family planning programs at the field level, among others driven by the family planning field workers. Identification of the presence of the target program, such as eligible couples is done by utilizing the family data collection andmonthly field control data [1]. Furthermore, these workers along with the cadres and midwives doing counseling to the target so that they are willing to follow the family planning program by using one of contraceptives methods.

Mobilization of contraceptive services by family planning field workers faces various problems. First, the existence of these officers is being reduced. At the national level, the number had decreased from 42,000 in 2003 to 22,000 in 2014. Similarly, in East Java the number had decreased from 3,269 in 2010 to 2,602 in 2014, with an average ratio of 1 worker for 3 villages. Secondly, the diversity of work unit manager nomenclature of the family planning program in the districts/municipalities, in which the family planning program is not the only basic tasks, leading the field workers have obligation to carry out other duties assigned by their organization.

Internal evaluation conducted by the BKKBN in 2013 indicated that currently the operational mechanism cannot be implemented properly by the field worker due to various constraints, such as the large number of villages as their working area and inadequate coaching from district level Offices/Boards of family planning, as well as the increasingly complex state of working environment. The ability to have better understanding on the problems faced in the implementation of the officers' duties, as well as the ability to

formulate alternative solutions are required since they get more and more extended working areas and duty scopes. A learning process that enables field workers to continuously improve their ability to deal with issues relating to the performance of their duties are needed because of the increasing complexity of the working environment problems faced by field workers. Senge, 1990, proposed a concept called learning organization, which contains five disciplines, i.e., shared vision, personal mastery, team learning, mental models and systems thinking. It is said that the fifth discipline, systems thinking, is a discipline that holds the most important role for the occurrence of a good learning in the context of complex and constantly changing environment. In other words, a person's ability on systems thinking can determine their success in performing learning in order to address the problems faced.

As well as other abilities within each person, the person's ability on system thinking can be affected by various factors, both from within and from the environment influences of the individual concerned whereas a person learning process can take place at the level of individuals, groups and organizations [2]. In order to improve its ability on systems thinking, the person conducts the learning, not only at the individual level, but also at groups and organizations level.

BKKBN as the agency responsible for the development of family planning field workers in Indonesia [3] needs to find a breakthrough so that their systems thinking skills can be developed. Therefore, in order to acknowledge the officers learning environment that is associated with the systems thinking skills, a study needs to be done to get an overview, which can then be utilized in determining the learning model development interventions to advance their systems thinking skills.

2.   RESEARCH METHOD

The study was conducted in East Java province. The population was FP field workers in East Java. The samples are purposively chosen of those who followed training in East Java Provincial BKKBN's Training and Development department. The sample size is 30 people with *center limited term* calculating system. Respondents were randomly selected using the serial number of arrivals on the training participants' attendance list. Instrument used to collect data was questionnaire on the learning environment developed by Watsons and Marsick (1999) andMoore, et al (2010) for the scale of systems thinking, which have been both validity and reliability tested [4],[5]. The system thinking scale is categorized into good, sufficient and less. The independent variable used in the study includes the characteristics of the respondents, the respondents' learning environment in the form of individual, group, and organization environment. The dependent variable is in the form of systems thinking scale. Data analysis was performed descriptively and analytically. Ratio scale data analysis performed by using Pearson correlation test while ordinal scale data will be analyzed using Chi square test.

3.   RESULTS AND ANALYSIS
3.1.   Characteristics of Respondents

Characteristics of respondents shown at Table 1 included, age which were categorized into three groups: less than 35 years, 35-45 years and more than 45 years, respondents' gender was differentiated into men and women, education was divided into diploma and bachelor, while length of service as field worker was grouped into less than10 years and more than 10 years, whereas learning environment was categorized as good, sufficient and less, whether at the individual, group, or organization.

Age is not a major factor that determines the respondents systems thinking scale because the majority of respondents (60%) aged over 45 years have sufficient category on scale. Based on sex it can be seen that the male respondents are 33% in sufficient and 30% in good category. For female respondents 37% are in the sufficient while only 10% are in good category. These results indicated that male respondents had better pattern than the female ones. According to respondents' length of service, those who were less than 10 years were 27% in the sufficient and 3% in good category while in the group that services more than 10 years, 33% were in sufficient and 27% were in the good category. Results of the study on the thinking scale of the respondents showed unsatisfactory results. Training and education about the systems thinking scale needs to be carried out on all FP field workers without exception. They seem not to understand and implement systematic system thinking in performing their duties in the field. More clearly, cross tabulation between respondent characteristics and systems thinking scale will be shown in Figure 1.

Table 1. Characteristics of Respondents

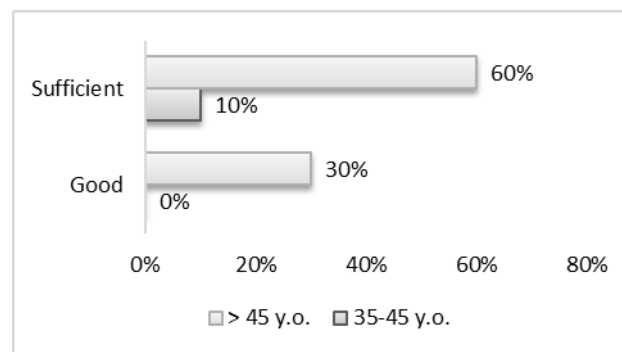| Characteristics | Category | Systems Thinking Scale | | | |
| | | Sufficient | | Good | |
		N	%	N	%
Age	35-45 years old	3	10%	0	0%
	>45 years old	18	60%	9	30%
Sex	Male	10	33%	6	20%
	Female	11	37%	3	10%
Length of service	< 10 years	11	37%	1	3%
	> 10 years	10	33%	8	27%
Individual learning environment	Good	2	7%	1	3%
	Sufficient	13	44%	4	13%
	Less	6	20%	4	13%
Group learning environment	Good	2	7%	1	3%
	Sufficient	12	41%	3	10%
	Less	6	21%	5	17%
Organization learning environment	Good	2	7%	1	3%
	Sufficient	11	37%	3	10%
	Less	8	26%	5	17%

Figure 1. Cross tabulation between Age and Systems Thinking Scale

Figure 1 shows that only 30 % of respondents have good systems thinking scale and all of them aged above 45 years old. However, 60 % respondents whose ages above 45 years old have sufficient systems thinking scale category. It indicates that age is not an indicator of systems thinking scale development. Training and education of the systems thinking scale require to be made to all groups regardless of age. The systems thinking scale is soft skills possessed because of habitual act or organization demand. It can be studied theoretically but require real practices. The enhancement of the systems thinking scale should not only be done through training but also in the form of project tasks that must be completed by each FP field worker to develop assigned indicators.

According to sex, as shown at shown Figure 2, clearly observable that male respondent have a better systems thinking scale than the female ones.This can be caused by several things. Male respondents theoretically have greater insight than female because they have tendency of using logic whereas female respondents in performing actions give more attention to attitudes, customs, and feelings. Strengthening the system thinking scale needs to be done especially on female field workers although it is undeniable that it is necessarily for the males to be trained as well.

Due to the education level of the respondents it is found that those who hold diploma degree possess sufficient system thinking scale category, while 67% of the bachelors have sufficient and only 30% have good category (Figure 3). This proves that the level of education is not a primary indicator of the systems thinking scale. It is created in the organization and attached as habit. Upgrading is needed to be done to all field workers in East Java regardless the education background. It is because the system thinking scale is not science they can learn at school. It requires habituation and practice to be able to cultivate a good system.
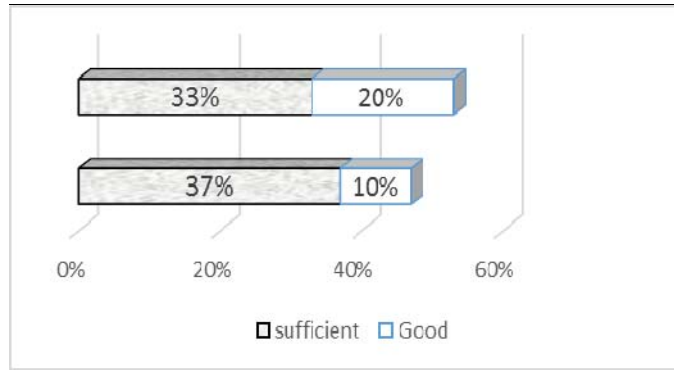
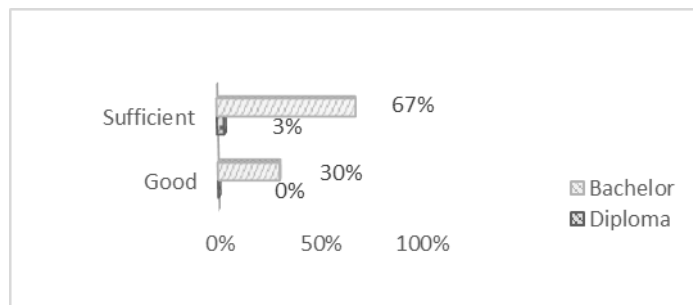Figure 2. Cross tabulation between Sex and System Thinking Scale

Figure 3. Cross Tabulation between Education and System Thinking Scale

According to the length of service, as shown at Figure 4, respondents whose years of service above 10 years have better scale than those who serve less than 10 years. Even so from the ones serve more than 10 years, not a little lies in sufficient category (33%). This results very striking show that systems thinking scale is shaped within the organization. Respondents who have longer service certainly have more experience; therefore their systems thinking in solving existing problems is more systematically as their experience and custom in the organization. However, improved understanding on the systems thinking has to be enhanced for entire field worker for the achievement of organizational goals and the creation of harmonically and systematically working climate.
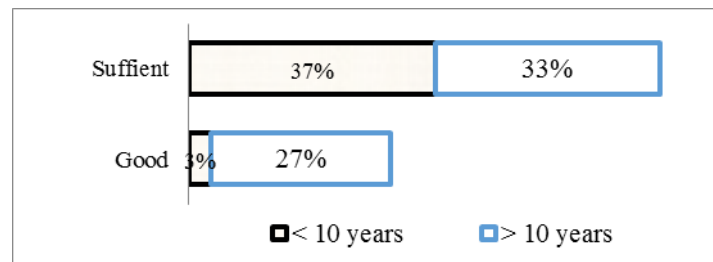

Figure 4. Cross Tabulation between Length of Service and Systems Thinking Scale

In summary, most respondents are at the sufficient level in terms of systems thinking scale. From age factor, apparently older ones (over 45 years) tend to have sufficient systems thinking scale (60% from the whole respondents). It spread quite evenly from age as well as the length of service factors. Regarding the learning environment, those who have sufficient systems thinking belong to sufficient learning environment as well. It similarly happens to group and organization learning environment.

3.2. Systems Thinking Scale based on Characteristics

From respondents' characteristics table above, after each FP field worker systems thinking difference scale test conducted, it displays that respondents' systems for all characteristics, education, age, sex, and length of service characteristics show no difference (Table 2).

Table 2. Systems Thinking Scale Difference due to FP Fieldworker CharacteristicsTest Table

Variable	Significance (p)
Age	0.173
Sex	0.865
Length of Service	0.085

3.3. Correlation between Respondents' Characteristics and Systems Thinking Scale

The researchers test the relationship between the characteristics of respondents and their systems thinking scale. The respondents' characteristics used by the researchers in this study included age, sex, and length of service as field worker. The test carried out using Chi square test with 5 percent margin error. Correlation test analysis results between the characteristics of the respondents and the scale of systems thinking are presented in Table 3. The result indicates that respondents' characteristics and system thinking scale are not significantly correlated. It means that system thinking scale is spread evenly on all respondents' background.

Table 3. Results of Correlation Test on Respondents' Characteristics Variable and Systems Thinking Scale

Variable	Chi Square	
	Significance	r Value
Age	0.534	0.218
Sex	0.440	0.172
Length of Service	0.490	0.360

3.4. Correlation between Learning Environment and System Thinking Scale

FP field workerlearning environment was grouped into three categories: individual, group or team, and organization. Data was collected using questionnaire containing some questions regarding the learnings' environment at each level. Similarly, the measurement of the systems thinking scale was done by questionnaire. Data analysis was performed using Pearson correlation test presented in Table 4.

Table 4. Results of Correlation Test on Learning's Environment Variableand Systems Thinking Scale

Variable	Pearson Correlation	
	Significance	r Value
Individual Learning's Environment	0.471	0.137
Group Learning's Environment	0.160	0.398
Organization Learning's Environment	0.017	0.4333

Table 4 shows the correlation between the learnings' environment characteristics at individuals, groups, and organizations level and systems thinking scale. It is seen that organizational learning environment has significant relationship towards field worker's systems thinking scale.

At individual learnings' environment, it is discovered that majority of respondents who have sufficient individual learnings' environment category mostly get sufficient system thinking scale (44%). Quite surprising result is seen when the majority of those who have good individual learning environment own only sufficient category of systems thinking scale (7%).

The result is conformable at the group level of learning environment. The majority of the respondents who have sufficient category at their group learnings' environment also have sufficient system thinking scale.

Furthermore, there is relationship between learning environment at individual and team (p 0.007 < α) and organization level (p 0.000 < α), as shown at Table 6. Individual is part of a team, therefore perception of learning environment ofteam and organizationmay affect the perception of learning environment at

individuals. There is also correlation from team/group learning environment with that of organization (p 0.013 < α). It can be infered that learning which took place at individual and team level is correlative with the organization level. In double loop theory of learning, organizational learning will affect individual and team learning. Hence, learning process will be successful when it's carried out simultaneously and sustainably, whether at individual, group or organization. This study finds that organization learning environment is the main determinant of someone's systems thinking skills.

Table 6. Correlation Analysis among Learning Environment Variables

Variable	System Thinking Skill	Individual Learning Environment	Group/Team Learning Environment	Organization Learning Environment
System Thinking Skill	1.000	0.471	0.398	**0.017**
Individual Learning Environment	0.471	1.000	0.007	0.000
Group Learning Environment	0.398	0.007	1.000	0.013
Organization Learning Environment	**0.017**	0.000	0.013	1.000

3.5. Discussion
3.5.1. Characteristics of Respondents
3.5.1.1. Age
The analysis results of difference test showed that there was no difference in the scale of systems thinking based on their respective age groups. The correlation test result also exhibited that the respondents' age did not relate significantly to systems thinking scale. This is slightly different from the results of research conducted by Joniwar and Heriyanto (2013) in Pekanbaru which reveals that age is one of the factors that affect the performance of FP field workers [6]. If performance is an act that bases on systems thinking capability, it's seemed that field workers' performance may not have been explained by systems thinking capability, since the last have to be taught and learned deliberately and need to be internalized in daily tasks.

Differences in results can also occur due to several things, including community and environmental differences among areas where the field workers serve. The community and work environment of the workers in East Java certainly have differences from those in Pekanbaru. Those factors can make impact towards a person's thinking pattern, accordingly there are possibilities that different working environment causes different result. Patterns and scale of systems thinking is strongly influenced by the state of the organization, then it is quite natural if the results from two places are different because of difference pattern leadership models applied in the organization.

3.5.1.2. Gender
Difference test results indicated that there is no difference in women and men systems thinking scale. The correlation test results also showed that systems thinking scale is not gender-related. It is more likely influenced by the organization. As part of BKKBN, family planning field workers should be able to think organizationally in order to achieve program objectives. Both females and males must have the ability to think systematically on the objectives of the organization, therefore there's no difference of the system thinking scale for both females and males.

The systems thinking skills is formed and developed within the organization so that the organization's role is very important in system thinking skill improvement. Organization members should be able to think systematically to achieve the main goals of the organization through programs developed by the organization.

3.5.1.3. Length of service
The difference test results showed that there were no differences in the respondents systems thinking scale among those who worked less than10 years and more than 10 years. Meanwhile, the correlation test results exhibited that year of service is not correlative with systems thinking skills. Eventhough those who worked longer might know the vision, mission and goals of the organization better, and that the organization where they work has been applying systems thinking environment in the execution of their duties, both groups have been exposed to the same training and learning program for the past several years that may ignored the effect of the length of service as field workers.

3.5.1.4. Learning Environment
A learning organization has characteristics as proposed by Culvert, et al (1994) and Watson and Marsick (1993), namely: continuously providing learning opportunities, using learning to achieve its

objectives, linking individuals performance with organizational performance, helping debriefing and dialogue, causing a sense of security to share thoughts openly and take risks, appreciate the creative spirit as a source of energy and innovation, and constantly aware of and interact with their environment [7],[8]. Senge's five disciplines (1990) are the key to achieving this kind of organization: personal mastery, mental models, shared vision, team learning and systems thinking. According to Senge, the fifth discipline, systems thinking, is the most important and determinant of the others [9].

An obstacle to the realization of a learning organization is the absence of an effective leader [10]. Learning organization needs leaders who constantly rethink fundamentally. Leaders become adesigner, teacher and guide of a shared vision [9]. Another obstacle is that debriefing and dialogue areconsidered disturbing, and there's no place for those who ask or identify problems [11]. The other one asstated by Watkins and Marsick (1993) is the inability to recognize and change the existing mental models, unguided learning, imposed vision, disjointed learning, individualism, disrespect culture and fear [8]. There are two approaches to LO understanding. Firstly, LO is acknowledged as a management tool to develop cognitive abilities that is the ability to think of the individuals in the organization. The second approach, which doesn't use the term LO much, is how learning takes place in the social order and called "communities of practice" or practices in society. In this case, learning is seen as part of participation in social life and practice whereas individual learning concerns with membership in the community to increase the skills of community members. OL/ LO approach as a management tool has some purposes. The first is to develop the members' ability in systems thinking, namely thinking of the organization as a whole, not part by part [9]. Another version is to develop a system for storing the results of the development of the organization, referred as organization's memory, for example information systems, and / or organizational processes and routines. Individual members can use these systems to solve problems and make decisions. The point is to reduce dependence on individual ability on tasks in the organization. This approach implies on organization members' rules for LO. Their thinking paradigms are developed to adjust and align their behavior in the organization, which is the vision of management. Thus the structures and processes within the organization are used to control the process of the organization. LO can be seen as a tool for aligning the behavior of the organization members as a whole.

In terms of organization as a holistic system, as referred to Senge (1990), it is the need to develop systems thinking for the organization's members [9]. Management leadership role is important, even the most important role here. Managers should serve as a model for the workers, as the star of learning and development for the organization's vision, outlining the "mental models" to be shared to all. According to Senge, holistic system perspective of the organization provides a new way to observe and think. Further, Senge puts organizations in a model of "four by four" to demonstrate a holistic view of the organization. However, it returns to a partial view as an element of the system in reality, for example the behavior dynamics and complexity ultimately focuses on structure and process elements. It means that any real work done by members of the organization is based on learning that focuses on understanding the individual.

Learning as individual understanding is based on the basic idea that all human beings should have a culture where they're born, and they must be community members. Learning benefit is seen as the transmission of culture and knowledge transfer. Socialization need to ensure that society can function as it should. Individuals meet with the culture in which she/he has to socialize in it, meaning learning to adapt and to internalize. In the context of LO, individual modified and aligned with the vision of the organization. In absence of social learning theory, the LO approach is based on the theory of individual learning. Learning is defined as an individual's understanding. The advantage of the learning process is to develop the capacity to system thinking, which requires a change in 'pattern' in an attempt to 'see the world' [9].

Learning organization is the integration of the three levels of learning into a single model, namely the learning of individuals, groups, and organizations, also two routes of learning from individuals to organizations and from organizations to individuals. Individual learning itself does not guarantee organizational learning. The process of knowledge transfer between members/persons/ people is needed for the institutionalization [2].

Measurement of organizational learning with the Dimensions of the Learning Organization Questionnaire-DLOQ was using seven dimensions of learning organization which formed the basis of DLOQ. The seven dimension are: 1) creating a continuous learning opportunities; 2) supporting debriefing and dialogue; 3) encouraging collaboration and team learning; 4) creating a variety of systems to accommodate and share learning; 5) empowering members toward a collective vision; 6) connecting the organization to the environment; 7) providing strategic leadership to support learning. DLOQ also associated with the performance results in the form of financial and knowledge performance. Some studies show a link between learning dimension to the performance.

Structured training is still very important and valuable, for example in models of competence or performance. However, there is increasing awareness that more useful training is happening informally in

daily tasks, in groups, through conversation. To support such training, it is necessary to create a learning climate and culture built by the leaders and key persons who learn from experience, influence and others, so as to create the environment from formed expectations and supports the achievement of the expected results, which in turn can be measured and appreciated.

A learning environment that is observed in this study is divided into a learning environment at the individual, group/team and organization, using DOLQ of Marsick and Watkins. The analysis shows that the learning environment at the organization level has a relationship with a person's systems thinking skill. On the other hand it also displays that the learning environment are interconnected to one another. In learning theory proposed by Crossan et al. (1999) it is argued that organizational learning is the integration of the three levels of learning into a single model, that is the learning of individual, group and organization, also in two routes of learning from individuals to organizations and from organization to individual (double loop learning) [2]. It is further mentioned that the individual learning itself does not guarantee an organizational learning. While the process of knowledge transfer between member/person/people needed to encourage the occurrence of institutionalization.

3.5.1.5. Individual Learning Environment

The results of the study show that there was no correlation perception of individual learning environment with systems thinking scale. But it has relationship with other types of learning environement, including group and organizational ones. It means that in this study, perception of individual learning environment has not been able to produce a real relationship with the capabilities of systems thinking. Castenada and Rios (2007) state that the part of the individual learning occurs as a result of intuition, supported by the attention and also additional processes, such as retention, production and motivation to guarantee a learning activity and influence [12]. In cases where the perception of individual learning environment has no relation with the ability of systems thinking, this is probably related to the existence of barriers in the learning process as well as environmental stimuli that requires a person to be able or not to think holistically. In the case where the settlement of problems tends to be fragmented, then the systems will determine a person's systems thinking skill.

In relation to the individual learning as part of the intuition, Crossan, et al. (1999) describes it as "an introduction in the unconscious on a pattern or possibility of one's existing (inherited) experience" [2]. It is possible that the dominant individual learning is in the form of patterned experiences that weakens a person's systems thinking skill.

3.5.1.6. Group Learning Environment

This study indicated that there was no correlation between the groups learning environment with the ability of systems thinking. Nevertheless there is a relationship between the group learning environment with other types of learning environment that is individual and group level. It is different from the study of Joe Power (2004) who finds that independent work group shows no significant relationship to the performance (between the performance of knowledge through learning) but it also mentioned that there is a qualitative belief that the independent group work can improve performance related to the correct order [13]. According to Crossan, et al (1999), group learning can be explained through a process called interpretation by identifying and developing intuition. Conversation plays an important role in the interpretation [2].

3.5.1.7. Organization Learning Environment

Correlation between systems thinking skill and the organizational learning environment shows that the organization's role is very important in supporting the occurrence of learning which ultimately put impact on the members' systems thinking scale. The role of the organization is in knowledge management, including information and communication technology, as well as various social and structural mechanisms. All of which contribute to the learning process, both at the individual, group or organization level [14]. Knowledge management also supports the process of making and taking the viewpoint at the of individual, group and organization level. In the case of this study, in which the individual's systems thinking related to organizational learning environment, the possibility of the organization to be able to facilitate learning through a variety of activities in the context of knowledge management.

4. CONCLUSION

There is a relationship between the scale of FP field worker's systems thinking with the learning environment at organization level (p 0.017 <α). The characteristic factors; individual, team/group learning environment; are unrelated to the system thinking scales. There are also relationships among learning environment (individual with group; individual with organization; and group with organization).

5. SUGGESTION

Individual learning on systems thinking for FP field worker's learning is necessary as the basic capital in the development of human resources, therefore the training/learning done so far needs to be revitalized, i.e. reorder the learning materials or modules that are taught in order to run more effective learning and leads to increase systems thinking skill. Learning and guidance needs to be developed into a useful integrated mechanism, not only for individuals but also for the organization.

Organization need to facilitate the learning, both at the individual, group/team and organization level itself. Organizations related to the implementation of FP field worker's tasks lies in the central, provincial and district/municipality. The facilitation forms include training and development of learning environments such as intense discussion within the group or organization to discuss various problems and their solution. This will help individuals develop their system thinking skills.

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