

## Strengthening Institutional Model of Women-Farmers Group in Developing Household Food Diversification

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**Abstract:** The research objectives are (1) examining food diversification and household food security levels in the Women-Farmers Group (KWT) in rural areas and (2) analyzing the existing empowerment model of KWT and developing an alternative model of KWT based on potency. The research was conducted in Bulukumba and North Luwu Regencies, South Sulawesi, Indonesia by taking unit of analysis at household of KWT level. The findings of the research include: diversification of household food consumption in KWT in both districts is still a relatively “less diverse”; except for vegetable consumption can be said to be “quite diverse”. This is caused by the diversification program through P2KP movement and yard use activities. Generally, food diversification scores obtained KWT classified as “food insecure” (mean score = 4). The needs potential based of KWT include: an increase in group training programs; economic enterprises development and understanding on food diversification. The alternative models of KWT based on potency, needs and experiences of KWT members include (1) model of institutional support (assistance, facilities, promotion and learning process) and (2) model of human resources capacity of group members include: appropriate training and development of leadership potency to increase capability in recognizing and solving problems of food diversification and understanding on nutrition and food.

**Keywords:** Food diversification; food security; model development; women-farmers

## 1. Introduction

Food diversification development efforts have been carried out by the government at the national, provincial, district and city. However, the implementation is running slow so less give the contribution to the household food security status. There are two causal factors: (i) the programs launched is created by the government, commonly these are not created by the target group or household, (ii) The development programs of community to develop food diversification have not involved optimally the community, especially women's groups (Bulkis, et.al.,2011). One of the potential of human resources, especially in rural areas is quite large (approximately 50 percent) are women. Women's empowerment leads to improvement in some aspects of children's welfare, in particular of health and nutrition (Duflo, 2012).

The Declaration of the Summit on Food Availability (FAO 2009) identifies women farmers as a key target in efforts to address food security issues. Likewise, a paper from the International Food Policy Research Institute (Brown et al, 1995) stressed

that "women are not just a process, purchase, and prepare food, but they also play an important role in national agricultural production, which produces good crops for consumption or for sale. The objectives of this research are (1) examining food diversification and household food security levels in the Women-Farmers Group (KWT) in rural areas and (2) analyzing the existing empowerment model of KWT and developing an alternative model of KWT based on potency.

## 2. Research Method

The research was conducted in Bulukumba and North Luwu Regencies, South Sulawesi, Indonesia by taking unit of analysis at household of KWT level. Data collection was carried out during June-August, 2013. The research was designed with qualitative and quantitative (mixed) method (Tashakkori & Teddlie, 2003 and Creswell & Clark, 2007). Qualitative data collected through Indepth-Interview and Focus Group Discussion (FGD); while quantitative data collected through household survey in KWT level. Number of sample are 8 KWT which consist of 240 household (see Table 1).

**Tabel 1.** Sample of Region, KWT and Household

No	Regency	Subdistrict	Village	Women-Farmers Group (KWT)	Hoseholds of KWT
1.	Bulukumba	Ujung Bulu	Kalumeme	Melati	30
		Ujung Loe	Dannuang	Mawar	30
		Kindang	Kindang	Cahaya Bukit	30
		Kindang	Benteng Palioi	Cahaya Pagi	30
2.	Luwu Utara	Baebunta	Bumi Harapan	Bouginvill	30
		Baebunta	Marannu	Kartini	30
		Masamba	Toradda	Cinta Kasih	30
		Masamba	Baloli	Kembang Tebu	30

Data of household food consumption was collected through food list method for 7 days and food recall for 24 hour ago (Jelliffe and Jelliffe, 1989), The household food security level is determined through food consumption diversification (SDP) approaches. If  $SDP \geq 5$  is classified as “food-secure” and  $SDP < 5$  is classified as “food-insecure” (Bulkis, 2012).

### 3. Diversification of Household Food Consumption and Food Security

#### 3.1 *Diversification of Food Consumption*

The type and amount of food consumed by the household of KWT members both in Bulukumba and in North Luwu Regency are relatively the same. The difference is in the amount of each food group. The food groups in this case are : (1) staple food, (2) Food source of protein ( in Indonesia we know as a group of “lauk pauk”) f.e.: meat, fish, egg, tofu, tempeh, and other food as protein sources are commonly consumed with rice. (3) vegetables, (4) fruits and (5) milk.

##### 3.1.1 Staple food

The availability of staple foods in Bulukumba and North Luwu Regencies are varied and relatively the same (rice dominant). This condition is similar the staple food of the general populations. Saikia and Deka (2011) have explained that rice is the staple food sources for half of the world population. It is an important source of energy, hypoallergenic, easily digested, providing protein with higher nutritional quality and has versatile functional properties.

In addition to rice, corn and tubers sometimes also used as a staple food in two regions. However, tubers (especially cassava)

is not so good as a staple food for children for a long time. Such as the findings of research in Kenya and Nigeria that consuming cassava as a staple food places children 2-5 years old at risk for inadequate protein intake. There are 53% of Kenyan children and 13% of Nigerian children had inadequate protein intake (Stephenson, 2010). Therefore, the consumption of cassava should be equipped with food of protein source. Generally, the consumption of staple food habit in the household of KWT is 2-3 times per day (breakfast, lunch and dinner). The type of staple food consumption in the household of KWT members in Bulukumba Regency is rice. It is the same condition in North Luwu Regency, except Kartini KWT.

Besides rice, sago is also used as a staple food by the household in North Luwu Regency but it is not for the household of Kartini KWT because the members of this KWT are not a native of North Luwu. Beside rice and sago, some kind of alternative staple foods of the household in paccelic conditions are corn, cassava and sweet potato. The food habit in this case is the same habit as the household of Jeneponto Regency in South Sulawesi (Rahmadanih *et.al.*, 2013). On average, the amount of staple food consumed by the households of KWT member in two regencies are almost the same and they have fulfilled the score of food diversification (SDP). The household SDP mean in each KWT is “2” (see Table 2).

##### 3.1.2 “Lauk-pauk”

“Lauk pauk” is a food group of protein source. Protein is one of the nutrients. The protein is one of the nutrient that is essential for health. Samra *et al.* (2011), food of pro-

tein sources can also provide satiating effect. The diversification of “lauk pauk” availability in regional level Both in Bulukumba and North Luwu, are : meat, sea fish, river fish, tofu, tempeh and eggs. Eggs are an inexpensive and highly nutritious food, providing 18 vitamins and minerals, the composition of which can be affected by several factors such as hen diet, age, strain as well as environmental factors. Miranda *et al.*, (2015) explained that although different compositions have been reported by several authors on average, the macronutrient content of eggs include low carbohydrates and about 12 g per 100 g of protein and lipids, most of which are monounsaturated and supply the diet with several essential nutrients. There is also scientific evidence that eggs contain other biologically active compounds that may have a role in the therapy and prevention of chronic and infectious diseases. The presence of compounds with antimicrobial, immune modulator, antioxidant, anti-cancer or anti-hypertensive properties have been reported in eggs.

Although eggs, fish, meat, tofu and tempeh are available at the regional level but not all of them can be access continuous by the household of KWT members in both regencies. It is caused by the high rates of “lauk-pauk” but purchasing power of household is relatively low. The type of “lauk-pauk” commonly consumed by household of KWT members are fresh fish, salted fish, tofu and tempeh. Eggs are generally consumed by the household which maintain the duck; while the meat is generally consumed if there is ceremonial event. The average of “lauk-pauk” consumed by the household

is very low when compared with SDP. The household consumption is 67.6 grams/capita/day to 98.3 grams/capita/day (see Table 2) while SDP standard (Hardinsyah *et al.* 1998) is 200 grams/kapita/day.

### 3.1.3 Vegetables

Vegetables include a group of plant foods that vary greatly in content of energy and nutrients. Additionally, vegetables supply dietary fiber, and fiber intake is linked to lower incidence of cardiovascular disease and obesity. The types of vegetables generally consumed are (1) leaf vegetables (spinach, kale, fern, moringa, mustard greens, cabbage, cassava leaves, papaya leaves, pumpkin leaves, bean leaves), (2) fruit vegetables (pumpkin, papaya, jackfruit, eggplant, banana, cucumber), (3) legumes fruit (beans, green peas, lentils and chickpeas), (4) bulbs tubers (carrots and potatoes). The type of vegetables consumed by the households of KWT member in two regions are relatively similar. Generally, each household are consume three types of vegetable for a week. All of the household have consumed vegetables more then SDP standard (150 grams/capita/day). So, the average SDP of the household in the each KWT level is “2”. It is means adequate consumption of vegetables. It is tend to be caused by vegetable crops cultivated in the yard. Food diversification and food security in the household level tend associated with the local food systems (Donkers, 2013), including food produced in the yard.

### 3.1.4 Fruits

Fruits commonly consumed in fruits season, except papaya and banana. The av-

**Table 2.** The Mean Score of Food Diversification Obtained Household of KWT Members

No	Diversity of Food Consumption	Household food consumption per capita per day in Bulukumba regency								Household food consumption per capita per day in North Luwu regency							
		Cahaya Pagi		Cahaya Bukit		Mawar		Melati		Boginvil		Cinta Kasih		Kartini		Kembang Tebu	
		N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S
1	Staple food (grams)	559.4	2	563.8	2	554.6	2	561.2	2	532.6	2	544.2	2	548.4	2	527.8	2
2	Lauk pauk (grams)	85.5	0	79.5	0	83.9	0	98.3	0	82.6	0	81.3	0	67.6	0	90.1	0
3	Vegetables (grams)	186.2	2	203.6	2	180.5	2	169.8	2	190.4	2	177.4	2	184.7	2	162.8	2
4	Fruits (grams)	92.7	0	104.3	1	81.7	0	94.5	0	76.9	0	98.2	0	60.8	0	115.4	1
5	Milk (ml)	12.1	0	10.1	0	13.8	0	14.2	0	11.4	0	17.2	0	9.0	0	11.6	0
<b>Score total</b>		<b>4</b>		<b>5</b>		<b>4</b>		<b>4</b>		<b>4</b>		<b>4</b>		<b>4</b>		<b>5</b>	

Note : N= number of consumption, S = obtained score

average of fruit consumption in the household is less than 100 grams/capita/day, except the household of Cahaya Bukit KWT (in Bulukumba) and Kembang Tebu KWT (in North Luwu). The household fruits consumption of Cahaya Bukit KWT are 104.3 grams/capita/day and Kembang Tebu KWT are 115.4 grams/capita/day (see table 2). So, the household SDP of the both groups is "1" while the six groups is "0". The consumption of household is lower than SDP standard (200 grams/capita/day). Fruits and vegetables are sources of phytochemicals that function as antioxidants and phytoestrogens.

### 3.1.5 Milk

Milk is very important for the health, especially for babies and toddlers or children. Anadolitu (2012) explained that milk changes with time of day and during the course of lactation. The positive effects of breastfeeding on the infant and the mother

have been noticed in both the developed and the developing countries. Data indicate that breastfeeding can save lives in countries with poor conditions or hygiene. It has been estimated that 1.3 to 1.45 million deaths in 42 high-mortality countries could be prevented by increased levels of breastfeeding.

On average, the amount of milk consumed by the household of KWT member is very low. That is 9.0 - 13.8 ml /capita/day (see table 2). If compared with the SDP standard (200 ml/capita/day), the milk SDP score of household is "0" (zero). Milk is consumed by household which are the children under two years.

### 3.2 Household Food Security

The concept of food security according to the World Health Organization is built on the following 3 pillars: (a) food availability: sufficient quantities of food available on a consistent basis; (b) food access: having

sufficient resources to obtain appropriate foods for a nutritious diet; and (c) food use: appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation (Uehara, 2012). In this case, household food security in the level KWT is measured through food consumption diversifications approach (Table 2)

The highest score of food consumption diversification was achieved by household of KWT members is “6” and the lowest score is “4”. The average score is 5 specially for household of Cahaya Bukit KWT in Bulukumba. So, the level of household food security is secure. This is the same as condition as Kembang Tebu KWT in North Luwu. While the mean score for six other KWT is “4”. It means that the level of household food security for these KWT is insecure.

#### **4. The Potential which can be Developed in Effort to Developing Food Diversification**

There are some potential that can be developed in an effort to diversify the development of household food consumption of KWT member in Bulukumba and North Luwu include (1) human resources, (2) natural (land) resources and (3) institutional resources.

##### *4.1 Human Resources*

Human resources in this study focused on women’s resources. Sohail (2014): Women are the component of our society but still they have hindrances in getting their rights. Women should be empowered with their rights of education, health, security, jobs, skills, decision making authority, better

living standard, and respect.

The potential of women resources include : (a) age, formal education, number of family and occupation of the KWT members (Table 3); and (c) the spare time of women farmers and other household members. The members of KWT in Bulukumba and North Luwu are still in dominant productive age. Besides the age, one of the potential which is also the power of the organization is the highest of formal education attained by the organization’s members (Table 3). The education of KWT members are variety. They are from ungraduate of elementary school (SD) to the undergradated level (S1). The education level can influence the knowledge level in managing the activities or occupation, and household food management include of ranging from food availability, food processing and preparing of food in the household (Sanjur, 1982). The housewives who are more educated tend to select and process the food properly and distributed it based on the household members needs, then the housewife less educated.

Spare time owned by KWT members ranged from 4 to 5 hours every day. There are also other family members who have spare time on average around 1-2 hours per day. If this spare time is used optimally to manage their yards for the development of crop diversification will be able to support the diversification of food availability and consumption at the household level.

##### *4.2 Natural Resources*

The natural resources in this case include (a) Farm land and (b) yard. The natural resources, specially farm land in Bulukumba and North Luwu regency have



**Table 3.** Profil of KWT Members

No	Profil of KWT Members		Number of KWT members (Percentage) in Bulukumba Regency				Number of KWT members (Percentage) in Nort Luwu Regency			
			Cahaya Pagi	Cahaya Bukit	Mawar	Melati	Buginvil	Cinta Kasih	Kartini	Kembang Tebu
1	Age (year)	< 30	43.3	13.3	20.0	20.0	26.7	10.0	16.6	10.0
		30-39	50.0	56.7	60.0	53.3	56.7	63.3	60.0	63.3
		40-49	6.7	20.0	13.3	20.0	16.6	20.0	16.7	16.7
		50-59	0,0	10.0	6.7	6.7	0,0	6.7	6.7	10.0
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2	Formal Educations	Primary School (unfinish ed)	16.7	10,0	16.7	10.0	13.3	10.0	6.7	6.7
		Primary School Junior	40.0	26.7	33.3	20.0	66.7	53.3	50.0	46.7
		High School Senior	30.0	13.3	13.3	30.0	13.3	13.3	16.7	10.0
		High School Universit y	10.0	43.3	30.0	36.7	6.7	23.3	20.0	30.0
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		3	Number of Family members	1-4	80.0	46.7	50.0	76.7	50.0	43.3
5-6	20.0			40.0	50.0	23.3	40.0	50.0	33.3	20.0
> 6	0.0			13.3	0.0	0,0	10.0	6.7	33.3	3.3
Total	100.0			100,0	100.0	100,0	100,0	100,0	100,0	100,0
4	Ocupatio ns	Farmer	86.7	83.3	90.0	86.6	86.6	90.0	86.6	86,6
		Seler	13.3	13.4	0.0	6.7	6,7	10.0	6.7	6.7
		Civil servant	0.0	3.3	10.0	6.7	6.7	0,0	6,7	6,7
		Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

not been used optimally. This can be related with production means, given the means of agricultural production, especially fertilizers and pesticides is difficult to reach because of the purchasing power.

Therefore, in order to increase farm production and household income, the optimization of land use is very important. The range area of farming land which needs to be optimized by the household of all KWT both in Bulukumba and in North Luwu Regency (see Table 4)

#### 4.3 Technology Resources

The types of equipment that is owned by a KWT is powdering machine. Both KWT in Bulukumba and North Luwu has gained powdering machine support through Food diversification programs (P2KP). However, the equipment has not been used optimally for the production of tubers which are managed by a group of members is still limited and the ability to use the equipment is still limited. Especially Mawar KWT in Bulukumba, there is a small bulding to use

as meeting place for members of the KWT.

#### 4.4 Organizational/Institutional Resources

The involvement of women in an organization also get enable knowledge, experience and skills (self-development capacity) for women, depend on which organization they are involved. So far, many organizations are available at the village level but the

participation of women especially members of the KWT is still limited.

Based on the results of Focused Group Discussion and in-depth interviews with officials and community leaders as well as officials KWT, there are some potential to support the development of institutional food diversification as summarized in Table 5.

**Table 4.** Farm and yard was owned by the household of KWT Members

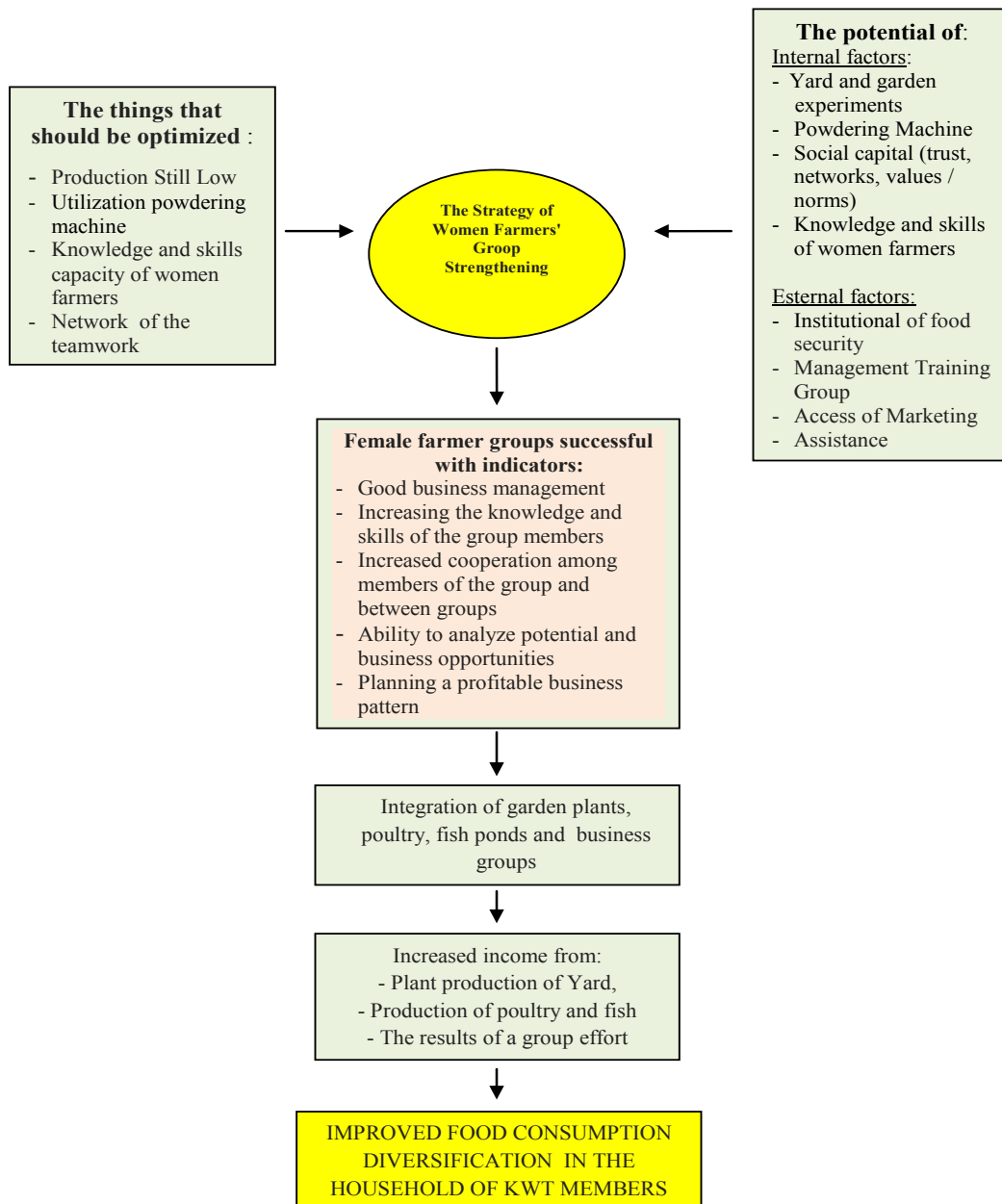
No	Natural Resources		Number of KWT members (Percentase) in Bulukumba Regency				Number of KWT members (Percentase) in Nort Luwu Regency			
			Cahaya Pagi	Cahaya Bukit	Mawar	Melati	Buginvil	Cinta Kasih	Kartini	Kembang Tebu
1	Farm Land (hectrae)	< 0.5	10.0	16.7	43.3	46.7	26.7	13.3	33.3	26.7
		0.5 – 1.0	53.3	26.7	46.7	40.0	56.6	53.3	40.0	56.6
	> 1.0	36.7	56.6	6.7	13.3	26.7	33.3	26.7	26.7	
	<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
2	Yard (m2)	< 25	60.0	00	50.0	76.7	56.7	50.0	16.7	50.0
		25 – 50	20.0	16.7	13.3	16.6	13.3	23.3	50.0	20.0
		> 50	20.0	83.3	36.7	6.7	30.0	26.7	33.3	30.0
		<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Table 5.** The potential of institutional which can be support to develop household food diversification

No	Institution	KWT in Bulukumba	KWT in Luwu Utara
1	Women Farm Groups (KWT)	They have a good commitment to improve their institution	They have a good commitment to improve their institution
2	Joined farmers group (Gapoktan)	It can be accommodate the production of farm	It can be accommodate the production of farm
3	Local government	Local governments provide support to the development of food diversification activities in the house hold level	Local governments provide support to the development of food diversification activities in the house hold level
4	Norm in KWT	All of the member must be cooperating in carry out activities There is a financial contribution to the group for members who use the funds group Reprimanded if there are members who do not participate in a particular activity	All of the member must be cooperating in carry out activities Mutual assistance in maintaining experimental farm Received financial penalties for members who do not participate in a particular activity
5	Rules / norms in the household	There is not "norm" that prohibits female of household members to carry out farming and other productive enterprises	There is not "norm" that prohibits female of household members to carry out farming and other productive enterprises



**Figure 1.** The Strategy to strength of KWT Institutional in Bulukmba and North Luwu Regency Regency



**5. Strengthening Institutional Model of KWT: Potential Based**

According to Uphoff (1986), the strengthening institutional model include are: (1) Models of the institutional support; (2) Models of the capacity building efforts of group members: and (3) Models of the institutional capacity strengthening. The things that need to be considered in the institutional strengthening of KWT both in

Bulukumba and North Luwu include: the development of institutional capacity and human resources with reference to the bonding strategy, bridging and creating strategy that includes: approach based on the forces of significantly such as (a) Repair institutional structure and function of women farmers; (b) Utilization impartial information and technology; (c) Improving training programs in groups; (d) Improve infrastructure devel-

opment activities farmer institutional such as meeting building; (e) Creating institutional transformational leader; (f) Development of economic enterprises; and (g) Improving knowledge about food diversification.

The strengthening institutional model which can be done are: (1) Models of the institutional support: assistance (technical assistance, funding, training ) in an effort to develop economic enterprises in an effort to increase the income of KWT member; (2) Models of he capacity building efforts of group members: (a) appropriate training and development of leadership potential (women empowerment), organization for local leaders, and so on, with a more informal method, horizontal); (b) the goal of training is to improve the ability to identify and solve problems in the development of food diversification and understanding of nutrition and food. The strategies which can be done to develop diversification of food consumption at the household in KWT level, include to synergize of the institutional support models and development model of women resource capacity as displayed in Figure 1.

## 6. Conclusion

Household Food diversification of KWT members in Bulukumba and North Luwu are relatively “less diverse”, except vegetable. Consumption of vegetables can be said to be “quite diverse” caused by the presence of food diversification program (P2KP) through the optimazing yard use. Generally, the level of household food security classified as “food insecure (mean score = 4), except for KWT-Cahaya Bukit (Bulukumba) and *Kembang Tebu* (North Luwu)

classified as “food secure” (mean score = 5). The needs potential based of KWT include: an increase in group training programs; economic enterprises development and understanding on food diversification. The alternative strengthening models of KWT based on potency, needs and experiences of KWT members include (1) model of institutional support (assistance, facilities, promotion and learning process) and (2) model of human resources capacity of group members include: appropriate training and development of leadership potency to increase capability in recognizing and solving problems of food diversification and understanding on nutrition and food.

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