Improving food security empowerment in Indonesia- Timor Leste border

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Abstract. Post Referendum 1999, Indonesia and Timor Leste have a strategic challenge to provide food consistently around the border. This research intended to discover an appropriate strategy to tackle fragility of food security in the land border of Indonesia-Timor Leste, to improve collaborative actions between parties, as well as, opportunity to actualize food cross-border trading between local farmers and factories. For the result, there are two approaches will be applied. First, the empowerment term refers to the strategy of empowerment in strengthening the capability and capacity of human capital as one of the determinant factors of the resilience and self-sufficiency achievement. Second, the gender approach looks at the women and men build confidence, resilience, and independence which one of them through an educational intervention that enable the local people to manage food chain. Atambua is a region count as relatively as high poverty, poor human capital, weak quality and competitiveness of agriculture products, livestock and fishery, SMEs, and infrastructure. Thus, field study research is applied to find the actual and strategic effort aim to lead the achievement of food security and to engage Atambua over food trade to Timor Leste.

1. Introduction
Nowadays, empowerment in many places in the globe became one of the prominent ways to enhance food security. UN defines the empowerment as an iterative process with the main components including an enabling environment that encourages widespread participation in decision-making that affects poverty eradication, social integration, and decent work for all as well as sustainable development[1]. Specifically, related to development, UNDP applied the empowerment in the definition of participation: The root of development must be from the people, not only for them. People must participate fully in the decisions and processes that shape their life[2]. Shortly, empowerment emphasized the active involvement of society and stakeholders at all levels for ordinary purposes.

With emerging challenges in the 21st Century, all countries are under threats, such as poverty, hungry, famine as a set of consequence over food insecurity. FAO pointed out that food insecurity is the lack of access to enough food. Chronic food insecurity as one types of food insecurity is a continuously inadequate diet caused by the inability to acquire food. The extended periods of poverty, lack of assets and insufficient access to productive or financial resources results in people disability to meet their minimum requirement of food. Significantly, boosting productive capacity requires
education, access to productive resources, such as credit and more direct access to food. Another transitory food insecurity is a condition when a household temporarily meet the derivation of production or access to enough food due to short-term shocks and fluctuations in food availability and food access, including domestic food production, food prices, and household incomes[3][4]. The worst impact of this situation is famine. Indeed, this situation requires a sustainable improvement to hamper the threat of hunger and support the maximization of the food safety objective. On the contrary, food security as specified on World Food Summit 1996, is defined when all people have an access both physical and economical at all times to meet their dietary include safe and nutritious food, and at the same time, supply food preferences for an active and healthy life [5]. In another word, World Bank pointed out food security as people access to sufficient food at any time for an active and healthy life [6]. The "enough food" in this term means the ability to access to sufficient safe and nutritious food. One of the prominent elements of development and poverty alleviation requires food security. Consequently, food security has become one of government priority, particularly in developing countries. Indonesia in the Soeharto era targeted food self-sufficiency based on the direction and pattern of economic development as manifested in the Five Year Development Plan (Repelita). The post Reformation under SBY era in Indonesia, the government issued Law of Food Number 18 of 2012 associated with food resilience and sufficiency. Supporting programs for the food sovereignty, Jokowi has prioritized diet and nutrition in National Medium-Term Development Plan for 2015-19, reinforced by one of the laws, Government Regulation Number 17 of 2015 on Food Security and Nutrition. East Timor referendum that occurred in 1999 continued to shift the geographical position of Indonesia-Timor Leste border. Atambua is known officially as a border territory since Timor Leste independence on 20 May 2002.

Geographically, Atambua has a strategic location in the central of Timor Island and adjacent to Timor Leste territory. Before the 1999 East Timor referendum, Kota Atambua had 12,512 inhabitants in 1990. The number after a year of the Referendum is given in 15,680 inhabitants[7][8], giving an average growth rate of 13.66 % for the period during 1990-2000. The number may seem surprising that the population growth continued rapidly when the Population Census reported adding the number to 26.395 inhabitants in 2010, compared to 5.35% in 2000-2010[9][10]. Population Census 2010, classified the Non-Migrant and Migrant who registered as over 5 Years population and Lifetime at the number of 15,547 non-migrants compared to 10,849 migrants[11]. The majority population worked at services about 3.357, agriculture field by the figures of 2.245, trade about 1.181, and communication of 1.139[12].One of the priorities of national development is to build Indonesia from suburbs by strengthening areas and villages within the framework of Unitary State. According to this priority, the National Medium-Term Development Plan for 2015-2019 assigns a particular area of development for Eastern Indonesia which conducted by equalization of inter-area development and to increase food sovereignty[13].

Interestingly, as published in 2014 Agenda of Development Areas, East Nusa Tenggara set as "gateway for tourism and national food support[14], which requires accelerated development of economic corridors in Eastern Indonesia. Atambua located in a central part of Timor Island and adjacent to Timor Leste, a strategic position of a given as a consequence of 1999 Referendum, is one of the national development priorities and at once as a gateway for food security as well as potential food supplier for neighboring states, Timor Leste. Kota Atambua has 24,9 km2 or 1.94% land area of 1.284,94 km2 Belu's total land area, compared to West Atambua with 15,55 km2 entire surface (1,21%) and South Atambua with 15,73 square kilometers (1,22%)[15]. This paper would allow food security dimensions to analyze the issue of "enough food" in Atambua, with an aim to find out the best current improvement in food safety to contribute to the success of Eastern Indonesia development in the long term. This discussion essentially focuses on Kota Atambua, a capital city of Belu Regency and the largest district of Atambua.
2. Method

The data study collection in this work was carried out in Atambua, East Nusa Tenggara Province, Indonesia, by using secondary data, by searching relevant literature study of women empowerment, food security, agricultural sectors, and statistical information from the official institution such as BPS, World Bank, OECD, FAO. The primary resource of this statistical data is BPS (taken the last data of BPS 2015). Understanding the food security condition in Atambua to assist writers finding out the empowerment improvement, the first essential tool of analysis is Food Security Dimensions pointed by FAO and World Bank, therefore empowerment in term applied to identify the empowerment existing and possible improvement conducted to Atambua. This work is also referred Harvard's Analysis as a framework to study women and men relations regarding improving empowerment in food security especially in the agricultural sector. A depth interview to agriculture extension officer at once as local people lived in Atambua and West Atambua area has been conducted successfully to find the fact of research materials related to the culture, technique of empowerment, people, habit, and women condition.

2.1 Experimental apparatus

The study on empowerment in a border area, organized by the CARE Institute Bogor Agriculture Team and published under the title "Community Border Empowerment Model Towards Community Mandiri Nusantara" summarized the ability of economic empowerment in building community empowerment. The empowerment strategy allowed by open access to natural resources to create sustainable income for the community through innovation in agriculture, women and youth empowerment, the development of new settlement areas, institutional development to publication and inviting various parties to participate in the program. The results of the program over the past three years were increasing the diversity of sustainable family livelihoods, lifestyle changes, and partnership development[16].

In a previous study on Atambua, Chairil Nur Siregar in a paper entitled "Building Atambua's Community Behavior Through the Utilization of Regional Potential and Border Security of the Republic of Indonesia with the Democratic Republic of Timor Leste" mentioned the social problems that occurred in Atambua, focused on the behavior of the Atambua community. Chairil Nur Siregar argued that Atambua has natural potentials in agriculture, animal husbandry, and tourism, including its strategic position with long coastlines, large river, and forest streams, especially in the mountains. Atambua is one of sustainable energy alternatives (sustainable) such as solar cell power and wind turbine. However, the potential is not well-managed due to limited skills, experience, knowledge, and community motivation in exploring the potential of the region. Chairil affirmed on behavioral changes to optimize the potential of the area, socialization, and training to solve security and crime issues; Maximizing the role of Babinsa, Linmas, and traditional security systems; negotiations to resolve border issues by involving third party functions.

Other studies about the involvement of women in the agricultural sector and food safety, Athiqah Nur Alami, Sandy Nur Irfal Raharjo and Yuly Astuti (2014) argued about women and food security based on their research and observation in Belu Regency. Their results showed that women in Belu have been responsible for different phases of food production, such as selecting seeds, planting, watering and taking care of plants[17].

2.2 Problem formulation

According to the explanation above, this work focused on some issues, there are: (a) why do Atambua have to improve food security empowerment; (b) to what extent the women and men relations concerning empowering food safety using gender approach in Atambua.

3. Results and Discussions

This study consist of four subsections, first food security in Atambua. Second, empowerment: Concept and Practice, and third gender approach for improving women's role and access for food production to
availability for food supply chain and productivity in agriculture. Fourth, the level of education about agriculture that women have to support their capacity for improving food security empowerment.

3.1. Food Security in Atambua

Food safety directly puts understood by Kota Atambua people, like the ability to eat and ability to serve food for at least one year a head. Measuring the food security, FAO applied four dimensions of food safety: 1) Food availability addresses the "supply side." It determined by the level of food production, stock levels, and net trade-including food aid. 2) Food access closely linked to the ability to retrieve an adequate amount of food. Therefore, the achievement of sufficient food objective becomes a stimulus to establish a greater policy on incomes, expenditure, markets, and prices. 3) Utilization, related to fulfillment on nutrition individually such as adequate diet, clean water, sanitation and health care. 4) Stability defines as keeping access to appropriate food at all times[18][19].

3.1.1. Food availability

As a district on non-coastal areas, the primary food resources identified are rice, corn, cassava, sweet potato, breeder, cow, goat, pig, and chicken. Kota Atambua has 45 ha of rainfed lowland rice production area, the 44 ha harvested area produced 185 tons paddy with 159 tons of milled grain and 116 tons of rice, and productivity 42 Kw/ha. At the same time, harvest of corn from 241 Ha total of harvested afforded to produce 498 tons with productivity 21 Kw/Ha. Cassava, another potential food crops, has 20 Ha harvested area which produced 60 tons and productivity 30Kw/Ha[20]. In the field of livestock, this district afforded to breed 1202 cows, 3152 pigs, 950 goats, and 78157 chickens[21]. This community meets the minimum number of farmers and the harvested paddy that was only on the outskirts of Kota Atambua.

Rice is mainly cultivation during the wet season. Reportedly, a Rain Gauge Station in Atambua measured, during 2015 the high numbers of rainy days showed up 13-21 days, occurred in December-April with the highest rainfall in January (BPS, 2015). Measuring the usual planting and harvesting dates with the ideal conditions and average moderate temperature 23.5 -26.5°C[22], can harvest four times a year. In fact, during 2016 farmers have had only once a year due to the dry season. As a consequence of rain-fed lowland rice that there is no irrigation water to shareholders anticipated the dry season.

To calculate the level of paddy stock is using the total number of production per capita/family divided by the total number of people/family. In 2015, paddy stock was 6,361 kg/year/per capita or 17,427 g/day/per capita and 30,78 kg/year/household or 84,328 g/day/household of 29,081 people and 6,010 families. It defines one household assumed five peoples by the average stock per capita is 6 kg. Indeed, the number of production was not able to meet the rice stock of people. Due to this issue, procurement of rice undertaken by BULOG and Sulawesi farmers to meet the food availability.

Food availability has a significant element of food security, a condition related to the supply of food. The practical challenges of meeting the food availability to Kota Atambua are (1) Irrigation. Rainfed paddy rice is the dominant crop in Kota Atambua, require irrigation system (dams, well fields) to enhance water efficiency which can support food production and productivity. Previously, the development of irrigation in East Nusa Tenggara has reinforced by Local Regulation Number 12 of 2009 related to irrigation for food security. (2) Lack of rice fields and productivity. It requires intensification defined an enlargement of new areas, and intensification as an application of technology on the existing areas to improve productivity. (3) The development of potential sources of food equivalent to rice, such as sorghum or cassava and corn which have the possibility of crop land area and can adapt to the climate and soil conditions of Kota Atambua. (4) Use of efficient cropping and harvesting dates.
3.1.2. Food access
Regulation is essential to support food access. By the Laws of 2012 and government regulation of 2015, the agency of food security (BKP) released a grand design of Strategic Plan of Food Security Agency 2015-2019, appointed by Ministry of Agriculture Number 11/Permentan/HK.140/4/2015 to increase national food security by food sovereignty and food resilience[23]. Furthermore, at the local level, Governor Regulation East Nusa Tenggara Number 6 of 2012 on The Regional Action Plan (RAD) for the Acceleration of Food and Nutrition Fulfillment of East Nusa Tenggara.

Refers to Minimum Regional Wages Belu Regency of IDR 1.425.000 equivalent USD 107,03[24], assumed to buy one kg of rice by the average of price was IDR 10.347/kg equivalent USD 0.777 for lower grade, then people’s purchasing power approximately to 137.7 kg/month or 4.59 kg/day. At the same time, seasonally, unskilled workers could count only USD 2.25 – USD 3.75/day. The youth have a minimum passion in agriculture. Moreover, the young people are more likely choosing actively as motor drivers Ojek. They perceive the work is enjoyable and comfortable, waiting for the passengers in the Ojek base, driving, and obtain some of the money. The youth and working age population tend to work in Malaysia, Kalimantan, Sulawesi, Bali. Even though living in host district, they work in agriculture area as not central players but assists their parents or family. High education is not their priority, but most importantly how to live, obtaining enough food and home. As reported through BPS, this situation shown by the number of registered job applicants by educational attainment showed elementary school was the highest numbers of 447 people, 192 bachelor degree, and 84 SMTA[25]. The minimum skills affect people’s income per month indeed. OECD which has defined the working age population as those aged 15 to 64. The youth population defines as those people aged less than 15, and the elderly population defines as people aged 65 and over[26]. Atambua has a total working age population of 17.105, compared to 10.166 youth population and 686 elderly population[27]. The data resulted, the working age population is the dominant number. Ideally, the number of working age population should be able to complete their wage spastically for obtaining adequate food.

3.1.3. Utilization
USDA estimates the nearest 200 calories per day, depends on age, gender, and physical activities[28].For once serving 100 g is equivalent to 130 calories, with carbohydrate 28g or 117 calories followed by protein 3g or 10.3 calories[29], then with the average food availability that can be consumed per capita as much as 17,427 g/day, concluded that the production of rice insufficient the calories needs. Clean water, sanitation, and health care are other variables to measure food utilization. Illustration by the data of 2010, the households of 3.307 from 5.502, get drinking water from protected wells. At the same time, the 4.303 families use the toilet, 4.554 use PLN electrical service. The data concluded clean water and sanitation were at right level. Health service facilities, personal health availability, and infant nutritional status also showed at a secure position[30].

3.1.4. Stability
Food balance affected by the ability to produce prominent foods, food distribution, import, and self-resilience over unpredictable situations. Food instability is resulting in high food prices thus affecting the accessibility of people in the fulfillment of food. Seasonally, when people meet their traditional events, such as the wedding, ethnic gathering events, custom house events mostly in July-September, because those ceremonies can reach in weeks, they tend to leave their works and other activities outside. People also tend to consume a lot of money, food, or some other properties. For instance, a man who marries a woman is obligated to provide money, and it can be about 100 million or 10-20 cows, and conduct a lively-party with inviting prominent families and people. Culturally, people assume the social class and self-esteem is reflected by how they hold an own event. In this season, even though they meet harvesting date, the food prices rise. Illustration, 1 kg of rice estimated around IDR 12.000 for lower grade, which is usually around IDR 10.000. Another hand, farmers prefer to sell rice to Timor Leste with a high price. Consequently, a combination of this situation would be affected by domestic food stability.
3.2. Empowerment for Food Security: Concept and Practice in Atambua

Empowerment has a broader definition and different indicators how the empowerment has ultimately applied within individual or group. World Bank (2002) defined empowerment is the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives. Meanwhile, capabilities are inherent in people and enable them to use their assets in different ways to increase their well-being. Human and social skills are the two significant capabilities that affect people to utilize their property. Human capabilities which contain good health, education, and production or other life-enhancing skills. Besides, social capabilities on social belonging, leadership, relations of trust, a sense of identity, life values, and the capacity to organize each other[31]. The term of “affect their lives” refers to the individual or common goals can be achieved. Therefore, the concept affirms the expansion of assets and capabilities of poor people with the aim to respond various barriers existing in their lives. Importantly, poor people as being the primary object of empowerment, are encouraged to conduct real actions in all contexts.

In this study of Kota Atambua, empowerment primarily aimed to support their food stock, productivity, and income per capita. The Agricultural Extension Officers (AEO) has a responsibility to conduct training on food local processing, including tubers, taro, corn, CCO, and prepared as being a home industry. Kawasan Rumah Pangan Lestari is carried out to maximize the yard land for horticulture. Meanwhile, Rural Empowerment and Agricultural Development (READ)[32] initiated by Investing Rural People focused on farmers and village institutions, such as smallholder farmers, boosting income and production, and strengthening village level institutions. By integrating community driven development and agricultural production activities into one complete package of support; training on cultivation to harvesting; CSR program from US corporations; monthly meeting face to face between Gabungan Kelompok Tani/GAPOKTAN/Farmers Group, and technically AEO directly visit farmers at each cultivation to harvesting in fields.

In fact, some of those programs are meeting various barriers. AEO and farmers take advantages the monthly face to face meeting to inspect administration books, exploring problems, such as infections, a conflict between members. But, they have the lack of spirit to have a meeting between members and problem solving, except when organization obtains many projects and require to a meeting. The writers assume this tendency affected by lower mentality due to low education, culture, and environment.

Farmers also manage food aid. For instance, the program of central government, governor of NTT, and sub-districts through the allocation of APBN and APBD for seed procurement and agricultural tools. However, in some cases, the distribution was meeting unfair when the internal committee do not spare a number as should be accepted by farmers. The internal committee conduct excision to pay back, for instance, their transportation fee or another spending in related to their work as a committee. Indeed, this unfair distribution tends to lead corruption acts. Another food aid from religious groups assistant, help people in “economic people,” indicates the basis of this economy is on people base. Some of the acts are agribusiness, cultivation to harvesting techniques, fattening beef cattle to the selected people through the system of 30:70 profit sharing. The 70% of profit allocated to farmers. The church offers a comprehensive training on the technique of fattening cow cattle.

Refer to the World Bank definition regarded to the expansion of assets and capabilities of poor people; the government has provided an opportunity to make a better asset and capacity ownership in selected skills for the dominant people in Atambua. Full participation only seems when people share the problem, but they do not have strong problem solving, critical thinking, and critical acts. As seen at the fact of fattening cow cattle, the empowerment enable to generate profit. The existence of a group of farmers, the empowerment activities, and the benefits to farmers describe as mentioned by Naresh C. Singh and Vangile Titi[33] suggested that strategy for empowerment has to be a multifaceted, multidimensional process involving the mobilization of resources. While the numbers are the success and growth, there are still people face barriers, such as education improvement,
organization management, finance management, trust and openness due to people mentality, culture, environment, and perception in development. The barriers and opportunity can be seen through not only at the level of an individual, but also but also organization and community. As defined by Barbara A. Israel, Barry Checkoway, Amy Schulz, Marc Zimmerman on empowerment which divides levels of analysis and practices into individual, organizational, and community [34].

Staub-Bernasconi noted to help empower we must first learn to speak openly about power with clients and then engage in the examination of authority stemming from personal resources (psychosocial strength and socioeconomic power), articulation power, symbolic power, positional power, or authority, and formal and informal organization power. How do attract the farmers’ interest to be more active in empowerment? Freire’s methods are group- and community-oriented methods of dialogue that promote critical thinking and action. Critical consciousness-raising and dialogue are the key ways in empowerment practice. Beyond the sharing of experiences and catharsis, these methods help people to think, see, talk, and act for themselves[35]. In the case of Atambua, farmers have no choice to use their land and money, due to a limitation of land ownership, particularly for exodus which the dominant numbers have no land property. The trend of farmers when they meet the harvesting date, they would be asked for money to the loan shark and pawn shops. Ironically, the loan sharks determine the price of a crop by 1kg= IDR 1000. The farmers obliged this way to capital cultivation reason. Pawn shops are the second trend of the source of income. However, they will lose their mortgaged goods when they meet failure in the repayment or interest loan. Attracting the farmers to follow the programs, the AOE invite a few number of farmers who have been successful. Atambua people will only believe what they see, and then they will follow the instructions.

3.3. Gender approach in representation and access for food productivity

The importance of using the gender perspective in this study is going to know how far the role of women and men in maintain sustainability for food productivity in the agricultural sector for improving the empowerment aspects. For this work, we use a schema of gender analysis by Harvard’s Model to describe women and men relations. The indicators such as (a) access, distribution on agricultural activity between them, the level of knowledge of intervention in a whole process, how much access is useful for women to exploit the resources; (b) participation, how far involvement among them in a process. Including strategy to resolve the obstacles to agricultural activities; (c) control, how far women are empowering their selves to decide decision in that activity; (d) benefits, to identify which are mostly giving positive changes and impacts for both or one of them[36].

The explanation above shows how gender approach will use to identify to what extent the women’s role in food productivity in Kota Atambua and able to be more independence by their knowledge of agricultural intervention activity, as well as the local people how both of them to manage food chain in their households. The farm sector as a primary component in Kota Atambua, so this work will describe how far the inequality of access, control, participation and benefits among women and men in improving food security empowerment in Kota Atambua.

Access, realize that women still lack on the level of access in agriculture, this assumption based on FAO that in developing countries 43% women as a part of labor forces in the agricultural sector [37], but the lack of access to productivity, especially as land’s owner. Regarding the context of access, the differences access between men and women towards land ownership, access to credit or personal loans and training. Even though the roles of rural women strongly have an impact on the success of production process, they still lack appreciation; rural women can be seen difficult to obtain their land’s access in Kota Atambua. Local customs are strongly influenced women’s life in Kota Atambua, so that give an impact on gender division between men and women to their livelihood, mainly farming or agriculture. According to Bupati Belu, Willybrodus Lay argued that gender issues and poverty ties with inequality of resources' distribution in domestic. These differences consist of access to real resources such as land ownership, capital, access to credit property and education. There is only Gapoktan (Gabungan Kelompok Tani) for male’s farmer in Atambua, the difference with others region that they have Gapoktan for both of them.
Participation, mostly in agricultural sector identical with men as first workers, but the fact lots of women who were involved in the field or plantation. According to BPS Kecamatan Kota Atambua[38], productive age average in Kota Atambua is about 15-64 years old, with composition is 8547 for men and 9121 for women, in which that statistical data showed agricultural industry as the main livelihood of 678 workers in Kota Atambua. In most cases, in East Nusa Tenggara, based on Agricultural Statistical (2013) this sector is still dominated by men as leading worker in the rice field, even as workforce there were women. But in 2015, of the total population are 29081, consist of 14153 (male) and 14928 (women)[39]. Jenny E. R. Markus[40] mentioned that women have a significant role in supporting food supply in their household, she identified that women worked in the early morning up to day light, watering plants, and they will continue it in the afternoon. During Timor Street to Atambua, she found that group of female farmers, in the rice field or farm. It shows that women activity is needed in the agricultural process to achieve sustainability in food security. The role of women in agricultural business is very substantial, even still found there was gender division of labor in the process such growing seasons, preservation, watering, harvest, post-harvest and marketing[41]. The level of women participation in the agricultural activity to maintain the sustainability of food security had differences in involvement. Mostly, female’s farmer, they worked not only in farming but also weeded out grass, giving fertilizer or helping their husband by bringing some food to the rice field. Women involved in the planting of corn and rice, growing and selling of vegetables and chicken while men require in land preparation, selling of rice and cattle. In the research study, Delima (2008)[42] mentioned that rural women’s role could be seen much complicated, unlimited only for the domestic sphere but also involved in production in agricultural activities. Women’s domain to support production in agricultural business consists of crops operations, weeding, harvesting and storage in Lumbung.

Control, in this context this work would identify how far women able to empowering their selves to decide and involved in the decision-making process related to their agricultural activity in Kota Atambua. Some studies mentioned that women determine by the patriarchy’s culture in East Timor so that it means inequality relations between and men in those process. Micato (2001) pointed out that women intended to be passive and have the lack of leadership, so male became powerful and dominant at the household level and community overall[43]. As Bupati Belu, Lay mentioned that men have full power to control division of labor not only at domestic level but also in livelihoods such as agriculture, livestock or animal husbandry. Including power on a family worker, so that impact on an equal division of labor between men and women[44].

Benefits, according to the discussion above, that women’s role in agricultural sector gave positive changes and impacts for women, especially by involved during the process, they still lack access so that they get less benefit at the household level.

3.4. Level of Education of Women
According to historical context, after the independence of Timor Lester, women as the most affected on that process, it can be seen that women’s education in this region had interrupted. Women much less attended in school than men. Kota Atambua as an area bordered near with East Timor on the east has experienced the impact of conflict during independence process and historically during under occupied by Portuguese.

Furthermore, central problems of women’s rights for adequate food supply and access in empowering their capacity to maintain sustainability for local food security influenced by the proportion of level of education between women and men. Even the standard is not always merely in a formal way, but schooling has a greater impact on building women capability to be more independent and involved in the decision-making process to support the sustainability of food security in Kota Atambua.

Statistically[45] formal education in junior high school (SLTP) in Kota Atambua, can be seen about 1107 (boys) and 1149 (girls) student. Further, the composition of a teacher was about 53 (male) and 81 female. There were differences in the number of student at this level in 2014 that about 1048
(boys) and 1007 (girls) in 2014, with teacher composition, are 63 male teachers and 85 female teachers. This composition has differences in some teacher in senior high school (SLTA) in 2015, there are 80 male teachers and 105 female teachers, for the numbers of students are 1113 (male) and 1637 (female) students. The data showed that in 2014, there were only 90 male teachers and 95 for women teachers, and the number of students in senior high school (SLTA), shown that 1090 (boys), 1580 (girls). So that level education of women in senior high school level is getting better than the composition of students in 2013 in which the composition of male’s students about 952 and 1540 for the female student with the number of male’s teacher were 70 and female’s teacher were 84. Meanwhile, in junior high school (SLTP) the composing both of them in 2013, can be seen 913 students (male) and 1066 student (female), with teacher composition are 64 male teachers and 78 female teachers[46].

By using the results above, we can identify that the number of students (girls) in the senior high school level in Kota Atambua is better than two years earlier, followed by the increase in the number of female teachers. As we know, the formal education is still counted as the primary factor to develop skill and knowledge, especially for women. Because of that women can increase their role in empowering food security. We argue that having better education, women will have particular expertise, experiences and better knowledge as well as skill to build their confidence for taking up responsibility and greater roles to support improvement in food security, not only in their households but also local communities level. So that, women can be involved and contribute to empowerment activities such as cadres of food security, training, encouragement for other women in their communities overall. In other words, women can be trained as cadres to support food safety activities, not only as the supporter for agricultural activities in their daily routine. Women can be involved in how to covers agricultures, animal husbandry and focus on vegetable cultivation and have quick responses in each activity regarding the improvement of food security.

We argued that level of knowledge of women in the agricultural sector is not only in how extent women get involved directly in agricultural activities such as farming or plantation. But also it focused on how women have better knowledge to support them for having a good response to maintain the food resources available for their communities, especially households after harvest seasons. Mostly, in a whole area not only in East Nusa Tenggara, many of local people have Lumbung, has a similar function as a warehouse but in different shapes. Lumbung usually used for keeping seeds, grains, or food products after harvest time. We can keep maize, sorghum, soya, rice; local people keep that food for their daily needs. The others how women become more responsible for keeping seeds safe from pests, especially to maintain food supply in future growing seasons. In this part, women should be able to choose the quality of seeds to avoid failure of growing seasons that could significantly impact for minimizing food supply; (c) including the ability of women to process all dietary products and to guarantee these have proper nutrition for their children and a whole family. Significant barriers in rural agricultural are women still lack the knowledge to maintain nutrition for their kids especially under five years old. So that, by improving and support their education, women could have better knowledge, not only plantation but also how to be better food provider for their family consumption.

Meanwhile, considered that rural female still has significant roles in providing food availability in household level and the local community, especially in food supply chain. Unfortunately, they still lack access and control in fairness to get more involved in maintaining food resources, because the system on agricultural activity still influenced by the strong tradition of patriarchy and local customs that affected the division of labor. So that even female workers in agricultural sectors have important roles in agricultural activities, but they strongly influenced by traditional legacy in society. For the local community in East Nusa Tenggara have a tradition legacy that based on a pre-historic economy in Timorese society, for example, buffaloes have always been important as a source of nutrition and a measure of wealth, but were also important in the preparation of agricultural field. Other influences of traditional legends related to the women’s activity and affected gender roles in agricultural is a past mythology of Liorai Sunbai. This myth told that Lords gave the local people their main crops after a
human sacrifice, mostly female. For general society in East Nusa Tenggara province, the belief that female body has transformed into seeds such as maize, rice, and other useful crops[47].

3.5. The Challenges for Increasing Women’s Role in Food Supply Chain

Women have a vital role in supporting food supply in agriculture, so they have to improve effectivity of gender mainstreaming in the agricultural sector. Through on MoU between Kementerian Pemberdayaan Perempuan dan Perlindungan Anak (KPP-PA) and Ministry of Agriculture, gender equality in this area could be better in the future[48]. But unfortunately, in our society, we still found that women’s conditions related to the food security. The first group is the lack of resources and no capacity, because of poverty. Secondly, full access to resources but the inability for empowering themselves. And third, able to improve their role but minim of resources to support their ability; (4) Has the capability to use their position and resources, full of knowledge and use their potencies to get benefits and improve economic life in their household.

Regarding categories above, we argued that the women’s role in food security in Atambua, have a significant role in maintaining sustainability food chains for local supply especially for their households, but they have many challenges. The obstacles came from the strength of customs in local communities in Kota Atambua. It was affected gender relations among society. Kota Atambua has to learn from others district such as Lembata. Lembata as one area in the East Nusa Tenggara, there was the particular program under PEKKA (Pemberdayaan Perempuan Kepala Keluarga) in which focused on how to strengthen economic of society through food security and land sovereignty[49].

Through the MAMPU programs, PEKKA runs several programs to maintain sustainability in food safety in Lembata Regency. The programs consist of cultivation of local food by using lands for farming, corn, green beans, cassava, bananas. Provides common Lumbung as reservation, so that women in which as heads of single households have a steady income and still able to maintain food security to support their daily needs. Finally, optimize the ownership of the land by planting various food products. The potential way to obtain availability of harvesting and food supply depends on the fertility of the soil. For instance, Beutaran in Ile Ape sub-district as the largest producer of green beans. Another strategy is Arisan Pangan, and it was functioned to provide daily needs, such as oil, sugar, and rice, they collected each member to contribute about 50.000 IDR per month to buy food products that not available yet on their land. Then, the results of Arisan Pangan will give to the member in which most needy. So that the importance of presences of local communities or organization to support all women in Kota Atambua to be more empowered to maintain food security sustainability.

Another way for increasing women’s role in food supply chain, the authors suggested to adopt strategy water campaign like as India, mentioned that The Self-Employed Women’s Association (SEWA) launched its Women, Work and Water Campaign in Gujarat, western India in 1995[50]. This campaign aimed to improve women access to water for domestic use and some agricultural irrigation. The SWEA build women’s awareness and training related to maintenance water sources.

3.6. The Evaluation of Food Security for Women Empowerment in Atambua

There are strategies to improve their availability to support food security in the local context, first, adopted the plan from others region, as mentioned in the discussion above that PEKKA having MANTAP’s program and became the successor to improve and maintain food security in Lembata, NTT. Second, the intervention of local actors for empowering and enhancing the women’s role in the agricultural sector, the unlimited local government directly but also a nonstate actor, community, and women. Third, knowledge without experiences is nothing. So by giving access, getting in women’s role in supporting the sustainability of food supply, in other words, as a part of a strategy that entangled those women’s in access, control and productivity so will improve the women’s condition, so it will help to reduce a risk of food insecurity. Fourth, strengthen the local cadres, to minimize the possibility of the threat of food insecurity and finally, knowing that female farmers in Atambua still lack access, control, participation and benefits for improving food security empowerment. So that,
local cadres have to build strong cooperation with the local organization to mobilize training or workshop for female farmers.

4. Conclusions
This work showed that empowerment for food security means giving opportunity and pathway to individuals or groups to improve better assets and capabilities, and completely for well-being achievement in the long run. Government and society have the chance to grow and develop people ability and focus on mentality and self-resilience. 1) Capacity building and managerial training through informal or formal education to improve people’s ability in agriculture, livestock, and trade. 2) Infrastructure development: irrigation. 3) Increase people participation. 4) Increase the number of AOE. As reported by BPS East Nusa Tenggara, Belu Regency had only 48 AOE in 2015, fewer than previous numbers in 2011, that was 174 AOE. 5) Koperasi Kelompok Tani building to provide tools of agricultural production, provision of production facilities, venture capital, purchase of farmer’s products. 6) Presenting various illustrations of success from several sources.

For women and men relations related to improving empowerment in food security, still dominated by men. Even women have participated and contributed to process production, but they still lack access, and no have particular responsibility due to her job in farming. Women have the important role, but the strength of local customs has weakened women’s position in the society. By improving strategy to maintain sustainability for food security in Atambua, it has to learn from others region to continue to improve economic their society and gender relations to obtain stability on food supply chain. Concerning getting fair chances between men and women in agricultural sectors in Atambua, the presences of the local community in which have access towards local society is important, because it could be seen as a social approach to support better empowerment for rural women overall.

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