

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

The Implementation Rice Policy based on Presidential Instruction on Household Food Security

Surya Abadi Sembiring

Lecturer, Faculty of Agriculture, Catholic University of Saint Tomas North Sumatera, Medan, Indonesia

Abstract:

The objectives of this research are (1) to describe the implementation of rice policy from the perspective of farmer, and (2) to describe the implementation of rice policy on the household food security. The research used cross section data. Cross section data were collected from respondent of 74 farmer as determined by purposive sampling in Sei Rejo villages in the rice production center in the Sub District of Sei Rampah, Serdang Bedagai District in the Province of North Sumatera. The results show that: (1) (1) farmers purchased subsidized fertilizers more higher than the highest retail price, (2) price of dried harvest paddy purchased by farmer more higher than government's purchasing price, (3) farmers do not receive seed aid from the government, and (4) the farmer household in Sei Rejo villages is availability to achieved food security

Keywords: *government purchase price, presidential instruction, rice policy, household food security, the ceiling retail price of fertilizer*

1. Introduction

Rice continues to be the most important food staple in Asia, contributing 40 - 80 per cent of total calorie intake. Rice is also the major source of livelihood of small farmers and agricultural labor household in this region, where at least two-thirds of arable land is planted to rice (David and Huang, 1996). Sawit and Lakollo (2007) expressed the view that among food commodities, rice is the most important food product contributing to employment, rural livelihoods and rural development. About 11.3 million people are engage as producers of paddy, Indonesia paddy production reached 54 million ton or 9 per cent of the world paddy production.

According to Sembiring (2011), in the Indonesian case, in the period 2000-2008, there are 8 Presidential Instruction Decree had published by government. Presidential Instruction for rice policy are government actions for improving the performance of rice economy in order to achieved farmer income increase, food security and economic stabilization. Based on Focus Group Discussion II, the essential food security dimension is food availability and accessibility. The problem of food availability and accessibility is not only at national issue but also on household and individual levels.

Productions decisions of farmers are affected by government policies (Halcrow, Spitze and Allen Smith, 1994). The implementation of rice policy effectively will impact on the achievement of intended objectives on the policy. There are many instruments in Presidential Instruction for rice policy are direct aid for prime seeds, subsidized fertilizer, irrigation improvement, government purchased price, rice distribution, government rice distribution, government rice procurement, import for rice and rice for the poor family (Raskin).

Food security may be defined as the ability of food deficit countries, or regions within those countries, to meet target consumption levels on a year-to-year basis (Valdes and Siamwalla, 1981). The indicated that food availability at the national level was unable to guarantee food sufficiency at the individual or household level. (Braun et al., 1992; Saliem et al, 2008). In the Indonesian case, according to Food Law, the concept of food security now includes aspects of food supply, distribution and availability (both physically as well as economically. (Saliem, et al., 2008).

According Valdes and Siamwalla (1981), the causes of food insecurity as follow: (1) production fluctuations, regardless of whether the fluctuation is in the food or the nonfood sector, and (2) price fluctuations, again regardless of whether it is the price of food or nonfood that is affected. Government must begin not only at the national level but rural level to reduce food insecurity. According to UNDP China (2001) and Ariani et al, (2008) argue that the cause of household food insecurity is very complex, such as the social political situation of agriculture and farmers, low productivity and fertility of land, climate anomalies, low modern agricultural techniques leading to low food production, and low household purchasing power caused by limited income from off- farm activities. According Sembiring et al, (2010) show that the ineffective policy implementations have caused scarcity of subsidized fertilizer, unachieved of balance fertilization, increase of production cost, and conversion of field rice. On other hand, an effective implementation is needed to achieve high yield.

According Herdt and Wickam (1978) there are five possible reasons for the yield gap: lack control over water, economic factors, variability in whether and damage by pests and diseases and no adoption of new technology. Lack control over water is the biggest constraint, for 23 percent of the difference between maximum possible and actual yields. Many of these constraints can be reduced by

appropriate investment, research, or policy action. The objectives of this research are (1) to describe the implementation of rice policy from the perspective of farmer, and (2) to describe the impacts of rice policy on the household food security.

2. Review of Literature

Mulyana (1998) found that the effects of the 40 percent currency devaluation will result in decrease in the quantity import for rice about 41.37 per cent and decrease consumption for rice 0.18 per cent, on other hand, rice procurement increased 2.40 per cent. Sembiring (2011c) analyzed the effects of depreciation and appreciation of currency of national food security. An econometric *model* consisting of 15 structural equations and 11 identity equations, using a monthly data for the period March 2005-September 2009. The impacts of 20 percent currency depreciation will result in average increase in rice surplus about 4.7 thousand ton (0.195 percent), because the magnitude of the reduction in the quantity import for rice is higher than the reduction in national rice stock, whereas the impacts of 20 percent currency appreciation will result in average decrease in rice surplus.

Sembiring (2011a) found that surplus rice has a negative sign, indicating that surplus rice will reduce the quantity import for rice. The short run of the surplus rice and exchange rate is -0.820, indicating that the quantity import for rice is in elastically responsive to changing rice surplus.

According to the concept food security by Valdes and Siamwalla (1981), in his simulation study, (Sembiring, 2011c) that the increase or decrease in the quantity import for rice influenced national food security. Sembiring et al (2012) constructed rice policy on the food security and on producer and consumer surplus, and used it for policy simulation to evaluate the effects of government policies on dependent variables. The important of this study are developing government policies of Presidential Instruction. This study show that the increase of the government purchases price of dried harvest paddy by 15 percent improve food security whereas the increase of the ceiling retail price of NPK fertilizer by 15 percent gave a negative impact on food security.

Sembiring (2011d) constructed an econometric model of the Farm Rice Policy. An econometric model consisting of 9 structural equations and 5 identity equations which was estimated using Two Stages Least Squares (2 SLS) method. The important result of this study is the increase of the government purchases of dried harvest paddy gave a positive impact on farmer income and household food security.

Sembiring (2011 e) construct an econometric model of effectiveness of rice policy. The effectiveness of output price policies influenced harvested area, paddy production and farmer food security is increase. The impact of increase of paddy production influenced farmer income increase. A recent study to describe household food security at farmer level (Sembiring and Simbolon, 2011). According to their study, there is a positive correlation between farm size and household food security, that is, the increase of farm size will result increase in household food security.

On other side, on demand for input, such fertilizers present that the quantity of fertilizers depend on farmer's income. Sembiring (2012) in his study constructed the simple regression, using seasonal data for period 2001 to 2011/2012 from 21 members of Sri Murni Corporation in Sei Rejo Villages. There is correlation between farm size and demand for urea, SP-36 and ZA fertilizers. On other side, farm size has a positive sign to the loan of money, indicating that the increase of farm size will increase the number for loan of money, and is significantly different from zero.

3. Methods

The research used *cross section* data. Cross section data were collected from respondent of 74 farmer as determined by purposive sampling in Sei Rejo villages in the rice production center in the Sub District of Sei Rampah, Serdang Bedagai District in the Province of North Sumatera. The sample consisted of 74 semi technical irrigated rice farmers in the wet season (October 2011 to March 2012). According to Saliem et al., (2008), the indicator of food security analysis from availability of food household.

4. Results and Discussion

Table 1 shows the kind of paddy varieties in the wet season. These data clearly show that the Ciherang varieties has the largest proportion of small, medium and large farm. On the small farm, there is 64.10 per cent of the farmer used Ciherang varieties. The percentages of the used Ciherang varieties of medium and large farm were 44.82 and 66.66, respectively. Mekongga varieties had the second largest proportion used of farmers on large farm (33.33 per cent), followed by the medium farm (13.79 per cent) and the small farm (12.82 per cent).

Table 1 present that the number of varieties used by farmers on small and medium farm are much more than large farm. There are only two varieties of paddy used by farmers, were Ciherang and Mekongga. Based on the Focus Group Discussion II suggests that golden rice program by adding vitamin A in rice. This program covers rice varieties of IR 64 and Ciherang which are transformed to golden IR 64 rice (would be released in 2014) and golden Ciherang rice (planned to be released in 2015). Based on their study, Hidayat et al(2005) show that farmer planted varieties Ciherang is superior varieties than other. Suprihatno and Daradjat (2008) suggest reason lead farmers to plant certain varieties, which is the main reason for high yield potential, high price of grain, consumer preferences, resistance to pests and diseases and the age of early maturity.

No	Paddy varieties	Farm Size					
		Small Farm		Medium Farm		Large Farm	
		Number of Farmers	Per cent	Number of Farmers	Per cent	Number of Farmers	Per cent
1	Ciherang	25	64.10	13	44.82	4	66.66
2	Mekongga	5	12.82	4	13.79	2	33.33
3	Cibogo	0	0.00	1	3.44	0	0.00
4	Sunggal	3	7.69	5	17.24	0	0.00
5	IR-64	1	2.56	1	3.44	0	0.00
6	Impari-13	2	5.12	2	6.89	0	0.00
7	Selamat	0	0.00	2	6.89	0	0.00
8	Mekongga and Ciherang	1	2.56	0	0.00	0	0.00

Table 1 : The Number of farmers used paddy varieties in the wet season in Sei Rejo villages.

Full owner is own land but do not retain any land rented from others. Part owner is own land and rent land from others, and tenant rent is farms for others. Table 2 show that there is a negative relationship between the farm size and the tenant rent. It means that the increase of farm size caused of tenant rent decrease. Data in this table show that the full owner has the largest proportion by small farm (84.61 per cent), on other side, has the smallest proportion of part owner, only 2.56 per cent but a higher tenant rent (12.82 per cent). The number of part owner increased during in wet season, while the number of tenant rent has been decreasing. The increase of land rent area cause of the average harvested area increase.

No	An Aspects of Farmer Land Resources	Farm Size (ha)		
		0.01-0.50	0.51-1.00	1.00-1.50
		Small Farm	Medium Farm	Large Farm
1	Average fullowner area (ha)	0.31	0.68	0.99
2	Average land rent area (ha)	0.05	0.11	0.36
3	Averageplanted area (ha)	0.36	0.79	1.35
4	Averageharvested area (ha)	0.36	0.79	1.35
5	Full owner (%)	84.61	79.31	50.00
6	Part owner (%)	2.56	17.24	50.00
7	Tenant rent (%)	12.82	3.44	0.00

Table 2: An Aspects of farmer land resources in the wet season in Sei Rejo Villages

Table 3 show that the number of farmer used subsidized for urea fertilizers have the greatest proportions by farm size. By contrast, the number of farmer used organic fertilizers had the smallest proportion (2.8 and 3.44 per cent, respectively). It is indicated that farmer depend on chemical fertilizers. In thought of farmers who considers urea is the main fertilizer while KCL and SP-36 fertilizer only supplementary (Rachman, 2003).

No	Government Policies	Small Farm		Medium farm		Large Farm	
		Number of Farmers	Per cent	Number Of Farmers	Per cent	Number Of Farmers	Per cent
1	Subsidized for Urea fertilizers	39	100.0	29	100.0	6	100.0
2	Subsidized for SP-36 Fertilizers	32	82.1	27	93.1	5	83.3
3	Subsidized for ZA fertilizers	34	87.2	24	82.8	4	66.7
4	Subsidized for Ponska Fertilizers	12	30.8	22	75.9	1	16.0
5	Organic Fertilizers	1	2.56	1	3.44	0	0.00
6	Certified Seed	4	10.3	5	17.2	2	33.3
7	Non- certified Seeds	35	89.7	24	82.8	4	66.7
8	Rice for the poor (Raskin)	25	64.1	15	51.7	1	16.7
9	Non-Raskin	14	35.9	14	48.3	5	83.3

Table 3: The Implementation of rice policies for fertilizers, seed and raskin in the wet season in Sei Rejo villages

Table 3 shows the implementation of rice policy by farm size. Most paddy farmers in Sei Rejo villages do not adopt certified seed. The percentages of the farmers adopt certified paddy seed on the large farm (33.3 per cent) followed by the medium farm (17.2 per cent) and the small farm (10.3 per cent). Nearly one-eight (89.7 per cent) of the farmers on the small farm do not adopt certified seed. The data indicated that the increased of farm size cause of the number of farmers adopt certified paddy seed increased.

There is correlation between Raskin and farm size. The largest proportions of number of farmers receive Raskin are found in small farm (64.1 per cent) and medium farm (51.7 per cent), on other hand, in large farm had less than 20 per cent. Hutagaol and Asmara (2008) found that the implementation of Raskin in West Java is less effective. This study suggests that the government to improve a village-level system control for the Raskin program, to raise monthly rice quota of poor families and its normative price.

Nevertheless, poor families in Sei Rejo North Sumatera paid a much higher price for Raskin (Rp 2000/kg) and received amount of rice far less than 10 kg/month (7 kg/month) in 2011.

No	Rice Policies	Farm Size (ha)		
		Small Farm	Medium Farm	Large Farm
1	Farmers purchased subsidized fertilizers at prices higher than the highest retail price (HET): % 1.1 Price of subsidized for Urea fertilizer 1.2 Price of subsidized for SP-36 fertilizer 1.3 Price of subsidized for ZA fertilizer 1.4 Price of subsidized for Ponska fertilizer	15.09 14.28 19.32 8.33	11.51 14.07 21.13 9.09	12.59 14.00 21.43 8.70
2	Average demand for fertilizers (kg): 6.1 Demand for Subsidized of Urea fertilizer 6.2 Demand for Subsidized of SP-36 fertilizer 6.3 Demand for Subsidized for ZA fertilizer 6.4 Demand for Subsidized for Ponska fertilizer	75.00 58.33 29.71 16.66	146.55 127.58 105.17 74.13	250.00 175.00 158.33 83.33
3	Price of dried harvest paddy purchased higher than Government's purchasing price (HPP): %	7.42	8.96	5.81
4	The percentages of harvesting and threshing paddy Loss (%)	4.7286	4.7285	3.8817
5	The quantity of government aid for seed (kg)	0	0	0
6	Government budget to improve irrigation infrastructure (rp)	0	0	0

Table 4: The implementation of quantity of input and output price in the wet season in Sei Rejo villages

Table 4 show that price of dried harvest paddy purchased by farm size higher than government's purchasing price. It is indicated that the implementation of government's purchasing price (HPP) of dried harvested paddy (GKP) is effective. Whereas farmers purchased subsidized fertilizers at prices higher than the highest retail price (HET). In this table, the percentage of farmers purchased urea subsidized fertilizers at prices small land medium farms more than ten per cent, 15.09 and 11.51 per cent, respectively. On other side, nearly one-fifth (20.43 per cent) of the price farmers purchased ZA subsidized fertilizers more expensive than the highest retail price (HET). It is indicated that the implementation of the highest retail price is not effective.

Sembiring et al, (2012) found that the effect of HPP increased 15 per cent increase harvested area. This policy result in an increase paddy production and rice production 17.907 per cent. An increase in rice production caused of farmer's rice stock. and domestic rice stock increased, 17.910 and 10.880 per cent, respectively. This policy result in an increase surplus of rice 19.793 per cent. On other hand, in their study show that the effect of HET increased 15 per cent decreased harvested area. This policy result in a decrease paddy yield and paddy production. The decrease in rice production caused of farmer's rice stock and national rice stock decrease, 0.751 and 0.116 per cent, respectively. This policy result in decrease surplus of rice 0.838 per cent.

Rahman et al, (2002) quoted Rahman (2003) show that in five provinces rice production, farmer purchased urea, SP-36, KCL and ZA fertilizers higher than highest retail price 18, 1, 31 and 19 per cent, respectively. Sembiring et al (2010) found that thought the highest retail price remains the same as in 2008, Urea and SP-36 paid by farmer in Sub district of Sei Rampahmore expensive, 24.8 and 21.7 respectively. According to Kariyasa (2007) expressed there are at least four benefits offered by the increasing price of urea fertilizer: (1) avoid the excess use of urea, (2) rice production and its conversion rate will increase, (3) fertilizers subsidy will decrease, and (4) farmers will consider organic fertilizer as alternative to chemical fertilizers.

In their study, Sembiring et al (2010) found that the ineffective policy implementation has caused the scarcity of subsidized fertilizers, unachievable of balanced fertilization, increase production cost, and increased of rice land conversion. Interestingly, among the farmers there is a positive relationship between farm size and demand for fertilizers by farm size. The recent studies (Sembiring, 2012) show that the increase of farm size cause of demand for Urea, SP-36 and ZA subsidized fertilizers is increased.

Irrigation infrastructure management is specifically considered in respect to the achievement of food security objectives (Pasandaran, 2007). On other hand, in the wet season there is not effort to develop Irrigation infrastructure. Table 4 show that correlation between paddy production and farm size. The increased farm size cause of paddy production increased. Similarity, the increased farm size cause of paddy for sold increased. In wet season farmers sell in to the market nearly 80 per cent of total paddy production. The largest proportion of farmer sold paddy, on other hand, the number of farmer unsold paddy less than 5 per cent by small farm.

Table 5 show that paddy production is not only for sold but to support the mosque and improve farms road. An increase farm size cause of the mosque and improve farm roads support increase. The largest proportions of paddy for stocks/consumption and seed on total paddy production in small farm, on other hand, in large farm had less than 20 per cent.

No	Description	Farm Size (ha)		
		Small Farm	Medium Farm	Large Farm
1	The quantity of paddy production (kg)	2 164.00	4 993.60	8 848.83
2	The quantity of paddy for sold (kg)	1 394.30	3 806.2	6 936.67
3	Percentages of number farmer for paddy sold (%)	97.44	100.00	100.00
4	Percentages of number farmer for paddy unsold (%)	2.56	0.00	0.00
5	Percentages of paddy for sold on paddy production (%)	64.438	76.222	78.390
6	The quantity of paddy for water tax payment (kg)	27.08	57.93	97.16
7	The quantity of paddy to support the mosque and improve farm roads(kg)	25.28	26.21	29.16
8	The quantity of paddy for stocks/consumptions and seed (kg)	659.49	889.14	1 453.33
9	Percentages of paddy for stocks/consumption and seed on paddy production (%)	30.48	17.81	16.42
10	Harvesting and threshing paddy Losses (kg)	88.794	250.17	332.50
11	Paddy availability (kg)= 9+10	748.284	1 139.31	1 785.83
12	Household rice availability (0.63* paddy availability)=kg	471.41	717.765	1 125.07
13	Number of family members(persons)	4.05	4.01	4.66
14	Household rice consumption per month (kg)	34.02	33.30	39.18
15	Household rice consumption for 4 months (kg)	136.08	133.20	157.12
16	Seasonal rice surplus (kg)	335.33	584.565	967.95

Table 5: The implementation of rice policy on household food security in Sei Rejo villages

The higher the number of family members affect the higher household rice consumption. Rice household availability is sufficient to cover household rice consumption. Seasonal surplus of rice is defined as household rice availability less household rice consumption for 4 months. Based on data in this table show that the consumption of rice farmers is 136.08 kg for 4 months in small farm. It is indicated that rice farmers in Sei Rejo villages not in food insecurity. According to seasonal surplus of rice indicates that a farmer household in Sei Rejo villages is to achieved food security.

5. Conclusion

Base in the wet season (October 2011 to March 2012) research: (1) farmers purchased subsidized fertilizers higher than the highest retail price, (2) price of dried harvest paddy purchased by farmer higher than government's purchasing price, (3) farmers do not receive seed aid from the government, (4) the farmer household in Sei Rejo villages is availability to achieved food security

6. Acknowledgement

Authors with thank to the Dikti (No: 05/K1.1.2/KU/2012) for their financial support for this research

7. References

- i. Ariani, M, E.Ariningsih,I.K. Kariyasa and M.Maulana. 2008. Empowerment of Household Facing Food Insecurity in the Era of Decentralization in Indonesia. In Food Security and Poverty in the Era of Decentralizations in Indonesia. Edited by Rusastra, I.W, et al. CAPSA Working Paper N0.102. United Nations and Bureau of Planning Ministry of Agriculture Republic of Indonesia.Bogor, Indonesia.
- ii. Braun, V.J., Bouis,H.,Kumar,S and Lorch,L.P,. 1992. Improving Food Security of the Poor: Concept, Policy and Programmes, International Food Policy Research Institute, Washington,D.C.
- iii. David, C.C. and J. Huang. 1996. Political Economy of Rice Protection in Asia. University of Chicago, Chicago.
- iv. Dawe, D. 2001. How far down the Path to Free Trade? The Importance of Rice Price Stabilization in Developing Asia. Food Policy 26 (2): 163-175.
- v. Ellis, F. 1993. Private Trade and Public Role in Staple Food marketing. The Case of Rice in Indonesia. Food Policy, 18(5): 428-438.
- vi. Herdt, R.W. and T.H. Wikham. 1978. Exploring the Gap between Potential and Actual Rice Yields: The Philippine Case. In Barker and Hayami (Editor) Economic Consequences of the New Rice Technology. The International Rice Research Institute, Los Banos.
- vii. Hidayat, J.R., M.O. Adnyana, dan A. Hasanuddin. 2005. Penyebaran Varietas Unggul Tanaman pangan dan Program Pengembangan. Analisis dan Opsi Kebijakan Penelitian dan Pengembangan Tanaman Pangan. Penyunting Partohardjono, S., D.Pasaribu, Hermanto. Monograf No 1, 2005. Pusat Penelitian dan Pengembangan Tanaman Pangan, Badan Penelitian dan Pengembangan Pertanian
- viii. Hutagaol, M.P and A. Asmara. 2008. Effectivity Analysis of Public Policy for the Interest of Poor People: Case Study of the Implementation of Rice for the Poor Program in West Java, 2007. Agro Economic Journal, 26(2).
- ix. Kariyasa, K. 2007. Proposing Highest Retail Price of Fertilizers on Effectivity Rate of Paddy Purchasing Price Policy. Agriculture Policy Analysis, 5(2).
- x. Mulyana, A. 1998. Performance of the Indonesian Rice Supply and Demand and the Prospects of Self-Sufficiency Toward of Trade Liberalization: A Simulation Analysis. Dissertation. Graduate Program, Bogor Agricultural University,Bogor.

- xi. Pasandaran,E. 2007. Irrigation Infrastructure Management in the Framework of National Food Security. *Agricultural Policy Analysis*, 5(2).
- xii. Rachman, B. 2003. Evaluasi Kebijakan Sistem Distribusi dan Harga Pupuk di Tingkat Petani. *Analisis Kebijakan Pertanian. Pengembangan Sosial Ekonomi Pertanian*. Badan Penelitian dan Pengembangan Pertanian. Departemen Pertanian. Bogor. 1(3): 221-237.
- xiii. Saliem, H.P, Supriyati, E.M. Lakollo, and K.S. Indraningsih. 2008. Food Security in the Era of Decentralization in Indonesia. In *Food Security and Poverty in the Era of Decentralizations in Indonesia*. Edited by Rusastra, I.W, et al. CAPSA Working Paper N0.102. United Nations and Bureau of Planning Ministry of Agriculture Republic of Indonesia. Bogor, Indonesia.
- xiv. Sawit, M.H and E.M. Lokollo. 2007. Rice Import Surge in Indonesia. The Indonesian Center for Agriculture Socio-Economic and Policy Studies (ICASEPS) in Collaboration with The Action Aid International (AAI), Bogor.
- xv. Sembiring, S.A., Harianto., H.Siregar., B. Saragih. 2010. Implementasi Kebijakan Perberasan di Tingkat Petani: Kinerja dan Perspektif Ke Depan. *Analisis Kebijakan Pertanian. Pengembangan Sosial Ekonomi Pertanian*. Badan Penelitian dan Pengembangan Pertanian. Departemen Pertanian. Bogor. 8(4): 339-361.
- xvi. Sembiring, S.A. 2011(a). An Economic Analysis of the Presidential Instruction for National Rice Policy in 2005-2008. Dissertation. Graduate School, Bogor Agricultural University, Bogor.
- xvii. _____. 2011 (b). Dampak Perubahan Iklim Terhadap Ketahanan Pangan Nasional. Disampaikan dalam Seminar Nasional dalam rangka Hari Lingkungan Hidup Sedunia 2011. Program Studi Magister dan Doktor Pengelolaan Sumberdaya Alam dan Lingkungan (PSL) Pascasarjana Universitas Sumatera Utara bekerjasama dengan Badan Lingkungan Hidup (BLH) Propinsi Sumatera Utara. Medan 19-20 Mei.
- xxviii. _____. 2011 (c). The Impacts of Exchange Rate on National Food Security. Disampaikan dalam USU International Science and Technology Exhibition and Seminar. USU Press. Medan. Hal 273-278.
- xix. _____. 2011 (d). Model Ekonometrika Tentang Kebijakan Perberasan Pada Tingkat Usahatani. Prosiding. Pemerintah Propinsi Sumatera Utara Badan Penelitian dan Pengembangan Kerjasama dengan Dewan Riset Daerah Sumatera Utara. Medan. hal 174-183.
- xx. _____. 2011 (e). Model Ekonometrika Efektifitas Kebijakan Perberasan Terhadap Ketahanan Pangan Pada Tingkat Petani. Prodising. USU Press. Medan. Hal 385-393.
- xxi. _____. 2012. Deskripsi Permintaan Petani Padi Sawah Terhadap Pupuk Pada Koperasi Kelompok Tani Sri Murni Desa Sei Rejo Di Kecamatan Sei Rampah, Kabupaten Serdang Bedagai Propinsi Sumatera Utara. Prosiding. USU Press. Medan. Hal: 435-439
- xxii. Sembiring, S.A., Harianto., H.Siregar., B. Saragih. 2012. Dampak Kebijakan Pemerintah Melalui Instruksi Presiden Tahun 2005-2008 Tentang Kebijakan Perberasan terhadap Ketahanan Pangan. Forum Pascasarjana, Institut Pertanian Bogor. Bogor. 35(1): 15-24.
- xxiii. Sembiring, S.A dan R.Simbolon (2011). Deskripsi Ketahanan Pangan Rumah Tangga Petani di Kecamatan Sei Rampah Kabupaten Deli Serdang Propinsi Sumatera Utara. Prosiding. USU Press. Hal 190-203
- xxiv. Suprihatno, B dan A.A. Daradjat. 2008. Kemajuan dan Ketersediaan Varitas Unggul Padi. Padi. Inovasi Teknologi dan Ketahanan Pangan. Buku I. Balai Besar Penelitian Tanaman Padi, Badan Penelitian dan Pengembangan Pertanian.
- xxv. UNDP China, 2001. Food Security and Sustainable Agriculture, <http://www.oecd.org/Sgt/an>
- xxvi. Valdes, A. and A. Siamwala. 1981. Introduction. *Food Security for Developing Countries*. Edited by Valdes, A. Westview Press, Boulder Colorado.