

## IMPROVING FOOD RESILIENCE THROUGH PADDY COMMODITY DEVELOPMENT IN GROBOGAN REGENCY

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### Abstract

Grobogan has 7511.500 ha with 33% of it is agricultural land and 40% of its GDP contribution is from the agricultural sector. Paddy is one of the leading commodity that can be developed to the maximum number. In this study, We are classifying the area as a potential paddy production centers through the comparative advantage and competitive advantage paddy each Subdistrict in Grobogan with Location Quotient (LQ), Shift Share Analysis and Schallogram. We found that The Subdistricts that have the potential for the development of paddy production as supporting the contribution of the agricultural sector in GDP Grobogan is Ngaringan, Gubug, Tegowanu Godong, Penawangan, Klambu, Brati, Geyer, Tawangharjo, Kradenan. The Subdistricts that could be Recommended as the production centers, processing and packaging of paddy commodities in Grobogan, that are Karangrayung, Purwodadi, and Pulokulon. The SubDistrict which has advantages in paddy production are Grobogan, Brati , Purwodadi, Tawangharjo, and Ngaringan.

**Keyword :** food resilience, paddy, Grobogan

### BACKGROUND

Indonesia is one of the developing countries are experiencing problems of food, especially rice availability. In 1984-1986, Indonesia has experienced rice self-sufficiency. Contrary to the current conditions, Indonesia continuously to import rice to face the food problem. This caused domestic production can not meet demand for rice in the national level due to the population growth rate continues to rise while productivity growing food crops, especially paddy crops has declined. Here is a table of national food policy from the beginning of independence until now.

**Table 1**  
**The Food Policy of Indonesia Government**

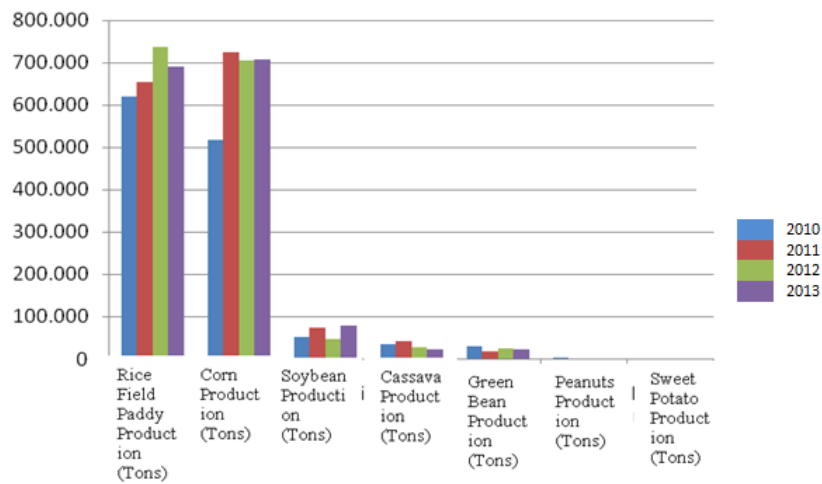
Era	Rezim Pemerintahan	Kebijakan Pangan
The Old Order (post-independence)	Soekarno (1952-1956)	Rice self-sufficiency through Kasimo's welfare programs
	Soekarno (1956-1964)	Rice self-sufficiency through the center of the rice program
Transitional Government (1965-1967)		

The New Order (The Development Order)	Soeharto ( Repelita I & II 1969-1979)	Rice self-sufficiency
	Soeharto ( Repelita III & IV 1979-1989)	Rice self-sufficiency
	Soeharto ( Repelita V & VI 1989-1998)	Rice self-sufficiency
The Reformation Era : (Transitional)	B.J. Habibie (1998- 1999)	Rice self-sufficiency
	Abdurahman Wahid (1999-2000)	Rice self-sufficiency
The Reformation Era (post 2000's)	Megawati Soekarnoputri (2000-2004)	Rice self-sufficiency
Post- The Reformation Era	Susilo Bambang Yudhoyono (2004- until now)	Food resilience

Source: Mears (1984), Dharmawan (2008),

If import policies from other ASEAN countries are still run by the government then made increasingly apparent dependence on imports to Indonesia. Food resilience of the nation will be a little threatened because of the needs of Indonesian rice reached 139 / kg / capita. When compared with other Asian countries, no more than 100 kg per capita per year. Thus, total demand for rice Indonesia became a very large considering its population of more than 237 million people in 2013. Central Java is one area that has contributed high rice productivity at the national level, because most of the use of land is used as agricultural land. Rice crops are very promising for much more developed. Indonesian people who make a habit of rice as a staple food, rice plants make an important commodity which must continue to be developed so that food security is maintained.

Grobogan Regent has the second largest area after Cilacap in Central Java province. This region has a wide 7511.500 ha with 33% of it is agricultural land and 40% of its GDP contribution is from the agricultural sector. In the agricultural sector there are five sub-sectors, one of which is a sub-sector of food crops. Which is included in food crops which are crops of rice, maize, cassava, soybeans, peanuts, sweet potatoes and green beans. The following picture crop production Grobogan.



Source: Grobogan in the 2013 figure (data processing)

**Figure 2**  
**Food Crops Production Grobogan 2010-2013**

Based on figure 2, it can be seen paddy rice is one of commodity that has the relatively highest productivity from year to year. It shows also that the paddy is one of the leading commodity that can be developed in Grobogan. But unfortunately, by information to the department's initial food resilience and BAPPEDA Grobogan, it has not found a clear plan regarding the development of paddy as efforts to reach food resilience. During this agency only specifies the food resilience production target of rice plants without achieving clear planning. Seeing these conditions, it is unfortunate if its potential is not fully utilized.

Based on the background, we decided to conduct research titled "Improving Food Resilience Through Paddy Commodity Development in Grobogan Regent".

**RESULTS AND DISCUSSION**

In this study, classifying the area as a potential crop rice production centers can be seen through the comparative advantage and competitive advantage rice crops each District in Grobogan. Comparative advantage can be obtained from the calculation of Location Quotient Analysis and while the competitive advantage can be obtained from the calculation of the Shift Share Analysis. Here are the results and discussion of Location Quotient, Shift Share, and schallogram:

**Location Quotient (LQ)**

Location Quotient (LQ) in this study is used to determine the paddy which have a comparative advantage in all districts in Grobogan. Comparative advantage is a commodity for a region that the commodity is superior relative to other commodities in the area (Tarin, 2003: 79). If the calculation results Location Quotient for rice crops in each subdistrict more than one ( $LQ > 1$ ) means the rice crops have a comparative advantage. If the result of Location Quotient shows numbers less than one ( $LQ < 1$ ) means the crop is in this case rice commodities do not have a comparative advantage. The Results of Location Quotient (LQ) show that 19 Districts in Grobogan during the last 5 years (2009-2013) can be seen in the following table:

**Table 2 Calculation results Location Quotient (LQ) Paddy Commodity in Grobogan**

Subdistrict	Year					Average
	2009	2010	2011	2012	2013	2009-2013
1. Brati	<b>1,00</b>	<b>1,08</b>	<b>1,22</b>	<b>1,27</b>	<b>1,44</b>	<b>1,21</b>
2. Gabus	0,84	0,70	0,87	1,06	0,90	0,88
3. Geyer	0,21	0,30	0,25	0,25	0,26	0,25
4. Godong	<b>1,60</b>	<b>1,85</b>	<b>2,12</b>	<b>2,02</b>	<b>2,06</b>	<b>1,94</b>
5. Grobogan	0,97	0,83	0,77	0,88	1,01	0,89
6. Gubug	<b>1,57</b>	<b>1,78</b>	<b>1,89</b>	<b>1,77</b>	<b>1,74</b>	<b>1,75</b>
7. Karangrayung	0,18	0,55	0,62	0,62	0,66	0,55
8. Kedungjati	0,41	0,43	0,30	0,21	0,18	0,28
9. Klambu	<b>1,20</b>	<b>1,31</b>	<b>1,53</b>	<b>1,47</b>	<b>1,50</b>	<b>1,41</b>
10. Kradenan	0,89	0,80	0,87	0,88	0,99	0,89
11. Ngaringan	<b>1,60</b>	<b>1,51</b>	<b>1,58</b>	<b>1,38</b>	<b>1,42</b>	<b>1,48</b>
12. Penawangan	<b>1,49</b>	<b>1,61</b>	<b>1,88</b>	<b>1,53</b>	<b>1,60</b>	<b>1,62</b>
13. Pulokulon	0,85	0,70	0,71	0,80	0,76	0,76
14. Purwodadi	<b>1,17</b>	<b>1,21</b>	<b>1,49</b>	<b>1,38</b>	<b>1,55</b>	<b>1,36</b>
15. Tanggungharjo	0,67	0,82	0,39	0,47	0,41	0,48
16. Tawangharjo	<b>1,14</b>	<b>1,11</b>	<b>0,98</b>	<b>0,98</b>	<b>0,98</b>	<b>1,02</b>
17. Tegowanu	<b>1,43</b>	<b>1,50</b>	<b>1,57</b>	<b>1,41</b>	<b>1,64</b>	<b>1,51</b>
18. Toroh	0,82	0,73	0,68	0,67	0,62	0,69
19. Wirosari	0,96	0,85	0,68	0,98	0,79	0,83

Source : BPS, subdistrict GRDP grobogan regent (data processing)

Based on Table 2 shows the results of the value of Location Quotient Grobogan each sub-district in 2009-2013, it is known that Grobogan has nine sub-district which has the result of calculating the average Location Quotient for crops

of rice more than one ( $LQ > 1$ ) is the subdistrict has rice commodities that have a comparative advantage for paddy that is:

**Table 3 The Subdistricts with Paddy Commodity that have a comparative advantage 2009-2013, Grobogan Regent**

No.	Subdistrict	Average
1.	Subdistrict Godong	1.94
2.	Subdistrict Gubug	1.75
3.	Subdistrict Penawangan	1.62
4.	Subdistrict Tegowanu	1.51
5.	Subdistrict Ngaringan	1.51
6.	Subdistrict Klambu	1.41
7.	Subdistrict Purwodadi	1.36
8.	Subdistrict Brati	1.21
9.	Subdistrict Tawangharjo	1.02

Source : BPS, subdistrict GRDP grobogan regent (data processing)

Based on Table 4.2 it can be concluded that the highest average for the results of the Location Quotient calculation is Subdistrict Godong with the average index 1.94 and the lowest is the Subdistrict Tawangharjo with the average index 1.02.

### The Shift Share Analysis

Shift Share analysis in this study is used to view the competitive advantage paddy Grobogan each Subdistrict in the value of Cij. Competitive advantage is the ability of a region to maximize any advantages to compete with its competitors.

**Table 4 The calculation result Cij paddy through the analysis of the Shift Share Each Subdistrict in the years 2009-2013 Grobogan Regent**

Subdistrict		Value of Cij Paddy Commodity
1.	Brati	<b>169136,77</b>
2.	Gabus	-313731,38
3.	Geyer	<b>551837,07</b>
4.	Godong	-355739,56
5.	Grobogan	-822260,34
6.	Gubug	<b>40525,44</b>
7.	Karangrayung	<b>1585860,44</b>
8.	Kedungjati	-97453,47
9.	Klambu	-98751,98
10.	Kradenan	<b>218258,58</b>
11.	Ngaringan	<b>211747,15</b>
12.	Penawangan	-593650,80
13.	Pulokulon	<b>183540,82</b>
14.	Purwodadi	<b>511181,60</b>
15.	Tanggunharjo	-217548,94

16.	Tawangharjo	<b>306190,41</b>
17.	Tegowanu	-512327,56
18.	Toroh	-569504,18
19.	Wirosari	-197310,03

Source : BPS, subdistrict GRDP grobogan regent (data processing)

Based on Table 4.3 , only 9 subdistricts have a positive or value Cij have a competitive advantage. Sub-district Brati with a value of 169,136.77, Sub-district Geyer 551,837.07, Sub-district Gubug 40525.44, Sub-district Karangrayung 1,585,860.44, Sub-district Kradenan 218,258.58, Sub-district Ngaringan 211,747.15, Sub-district Pulokulon 183,540.82, Subdistrict Purwodadi 511,181.60, Subdistrict Tawangharjo 306,190.41.

### Klassen Typologi

Typologi Klassen analysis can shows the ability of Subdistricts in the production of paddy is divided into four quadrants are (1) Superior Subdistrict , (2) Grow Subdistrict , (3) Potential Subdistrict, (4) Potential Subdistrict. In the table 4 is the result of the classification of paddy from 19 sub-districts in the Grobogan based on the production of food crops in sub-district level and with the production of food crops is the same at the district level. The use and interpretation of results of analysis tools Klassen Typologi on paddy commodities can be seen in Table 4 below.

**Table 4 Classification of the Subdistrict which has a paddy as the leading commodity analysis based on the analysis of LQ and SS paddy crops in 2009-2013.**

	SS(+)	SS (-)
<b>LQ &gt; 1</b>	<ol style="list-style-type: none"> <li>1. Subdistrict Brati</li> <li>2. Subdistrict Gubug</li> <li>3. Subdistrict Ngaringan</li> <li>4. Subdistrict Purwodadi</li> <li>5. Subdistrict Tawangharjo</li> </ol>	<ol style="list-style-type: none"> <li>1. Subdistrict Godong</li> <li>2. Subdistrict Klambu</li> <li>3. Subdistrict Penawangan</li> <li>4. Subdistrict Tegowanu</li> </ol>
<b>LQ &lt;1</b>	<ol style="list-style-type: none"> <li>1. Subdistrict Geyer</li> <li>2. Subdistrict Karangrayung</li> <li>3. Subdistrict Kradenan</li> <li>4. Subdistrict Pulokulon</li> </ol>	<ol style="list-style-type: none"> <li>1. Subdistrict Grobogan</li> <li>2. Subdistrict Kedungjati</li> <li>3. Subdistrict Tanggunharjo</li> <li>4. Subdistrict Toroh</li> <li>5. Subdistrict Wirosari</li> <li>6. Subdistrict Gabus</li> </ol>

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Source : BPS, subdistrict GRDP grobogan regent (data processing)

Based on the analysis *Klassen Typologi* in table 4.4 can be seen in the ability to produce paddy in 19 sub-districts which are in Grobogan for five years of observation (2009-2013), that is:

a) Superior Subdistrict in paddy production (Quadrant I)

Only five Subdistricts as Superior Subdistrict in paddy commodity that are the Subdistricts Brati, Subdistricts Gubug, Subdistricts Ngaringan, Subdistricts Purwodadi, and Subdistricts Tawangharjo. Superior Subdistrict has comparative advantage and competitive advantage in paddy production.

b) Potential Subdistrict in the paddy production (Quadrant II)

Only four Potential Subdistrict, that are Subdistrict Godong, Subdistrict Klambu, Subdistrict Penawangan, and Subdistrict Tegowanu. Potential Subdistrict has a comparative advantage in paddy production, but does not have a competitive advantage.

c) Growing Subdistrict in the paddy production (Quadrant III)

Four growing subdistrict are Geyer, Karangrayung, Kradenan, and Pulokulon. Growing Subdistrict has a competitive advantage but do not have a comparative advantage for the production of paddy

d) Supporting sub-district in the paddy production (Quadrant IV)

Six Supporting sub-district are Grobogan, Kedungjati, Tanggunharjo, Toroh, Wirosari dan Gabus. Supporting sub-district do not have a comparative advantage and competitive advantage in in the paddy production.

### Schallogram

Schallogram is a tool to see the level of completeness of infrastructure in each region according the existing research object. In this schallogram calculation results will get the result that the division of districts in Grobogan with appropriate classification hierarchy. There are districts that received the top ranking and could

be recommended to be the center of the paddy processing industry and the backward Subdistricts could be recommended to completeness of the infrastructure .

This technique is used to see the Subdistrict which already has a complete social infrastructure and adequate general and the township will be recommended into industrial centers processing and packaging of rice crops results. Results of challogram calculation , In Grobogan there are 19 sub-districts that will be the third division of the hierarchy is the hierarchy 1 which consists of districts that are ranked as 1-6 while the second hierarchy consists of districts that were ranked 7 -13 and for the hierarchy III consists of districts in the ranked 14-19. Schallogram calculates the whole social and public facilities in each sub-district.

According to the table of calculation results schallogram Infrastructures of the 19 districts in the 2009-2013 Grobogan obtained results are:

1) Hierarchy I

Hierarchy I contains sub-district was ranked 1 s / d 6 in the calculation completeness schallogram infrastructure in the Pulokulon with infrastructure number 3323, Toroh 3146, Purwodadi 2688, Grobogan 2.151, Wirosari 2.114, and Karangrayung 2075.

2) Hierarchy II

Hierarchy II contains the ranking of Subdistricts with 7-13 in the calculation of the completeness of infrastructure use schallogram, that are : District Gubug with infrastructure number 2064, Kradenan 1840, Geyer 1,784, Kedungjati 1439, Gabus 1,684, Klambu 1.430, and Godong 1,292.

3) Hierarchy III

Hierarchy III contains contains the ranking of Subdistricts with 14-19 in the calculation of the completeness of infrastructure use schallogram, that are: Penawangan with infrastructure number 1,182, Ngaringan 1324, Tegowanu 1145, Brati 979, Tawangharjo 896, and Tanggunharjo 689.

Based on the above results it can be seen that have the most infrastructure is Pulokulon districts and the lowest is the Tanggunharjo. The Subdistricts in hierarchy I are recommended will become centers of industrial processing and



packaging paddy commodity. Meanwhile, the Subdistrict in the hierarchy III will be recommended to Completeness infrastructure

### Overlay

Overlays are used to determine the direction of development of paddy from each District in Grobogan based Location Quotient, Shift Share, Klasen Typologi, and schallogram. In each cluster of sub-sectors of food crops that would designate districts that have the potential to become a center for the production of paddy and pointed to potentially become the central districts of processing the paddy. Here is a table overlay from the calculation of Location Quotient, Shift Share, Klasen Typologi, and schallogram:

**Table 5 Overlay Location Quotient, Shift Share, Klasen Typologi, and schallogram All Subdistricts 2009-2013 in Grobogan Regent**

No.	Subdistrict	LQ	SS	Ranking Skalogram	Arah Pengembangan
1.	Brati	1,21	169136,7662	17	Paddy Production Center
2.	Gabus	0,88	-313731,3841	11	-
3.	Geyer	0,25	551837,0712	9	Paddy Production Center
4.	Godong	1,94	-355739,5628	13	Paddy Production Center
5.	Grobogan	0,89	-822260,3427	4	-
6.	Gubug	1,75	40525,44128	7	Paddy Production Center
7.	Karangrayung	0,55	1585860,435	6	1. Paddy Production Center 2. Paddy Processing Center
8.	Kedungjati	0,28	-97453,46482	10	-
9.	Klambu	1,41	-98751,9762	12	Paddy Production Center
10.	Kradenan	0,89	218258,5801	8	Paddy Production Center
11.	Ngaringan	1,48	211747,1477	15	Paddy Production Center
12.	Penawangan	1,62	-593650,8042	14	Paddy Production Center
13.	Pulokulon	0,76	183540,817	1	1. Paddy Production Center 2. Paddy Processing Center
14.	Purwodadi	1,36	511181,5991	3	1. Paddy Production Center 2. Paddy Processing Center
15.	Tanggunharjo	0,48	-217548,9446	19	-
16.	Tawangharjo	1,02	306190,4065	18	Paddy Production Center
17.	Tegowanu	1,51	-512327,5658	16	Paddy Production Center
18.	Toroh	0,69	-569504,1849	2	-
19.	Wirosari	0,83	-197310,0338	5	-

Source : BPS, subdistrict GRDP grobogan regent (data processing)

Based on the results of the overlay in table 5 can be used by each subdistrict to determine the planning of paddy development.

## CONCLUSION

Based on the results of research and discussion can be concluded as follows:

- 1) The Subdistricts that have the potential for the development of paddy production as supporting the contribution of the agricultural sector in GDP Grobogan is Ngaringan, Gubug, Tegowanu Godong, Penawangan, Klambu, Brati, Geyer, Tawangharjo, Kradenan.
- 2) The Subdistricts that could be Recommended as the production centers, processing and packaging of paddy commodities in Grobogan, that are Karangrayung, Purwodadi, and Pulokulon.
- 3) The SubDistrict which has advantages in paddy production are Grobogan, Brati , Purwodadi, Tawangharjo, and Ngaringan.

## SUGGESTION

- 1) The sub-districts are potentially in the paddy production is expected to be more attention to equitable access to fertilizer distribution and also The irrigation system.
- 2) Cooperation and mutual support between the Government of Grobogan, related stakeholders like Bappeda, Department of Agriculture, and farmers to coordinate the development of the agricultural sector especially the development of paddy commodity.
- 3) Grobogan government pay more attention to the completeness of infrastructure in all Subdistricts in Grobogan. It is expected to increasing the economy of Grobogan.

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