



# Value Chains of Carrot Commodity On Suthomadansih Agropolitan Area In Karanganyar Regency

(Rantai Nilai Komoditas Wortel Di Kawasan Agropolitan  
Suthomadansih Kabupaten Karanganyar)

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**Abstract:** *In 2007, Central Java Government has been starting the implementation of agropolitan program in some regency that has the potential in the agriculture sector, Karanganyar Regency one of them. Through this program, Suthomadansih Agropolitan Area was established. One of the leading commodities from Suthomadansih is carrot commodity. Carrot commodity is then taken into consideration in the implementation of agropolitan program, in the form of provision of infrastructure and community development programs. The objectives of the research study are to investigate the value chain of carrot in Suthomadansih, as well as to analyze how the implementation of agropolitan program supports the value chain of carrot. Meanwhile, in order to investigate how the implementation of agropolitan program in suthomadansih supports to value chain of carrot, there are three indicators that will be identified; the development of supporting infrastructure, agribusiness system, and development of human resource (Iqbal and Iwan, 2009). Both of qualitative and quantitative analysis has been applied into the study with the performance table of the implementation of agropolitan program and value chain analysis as tool to conduct the analysis. Based on the value chain of carrot in Suthomadansih, some development programs from Local Government through the agropolitan program has been conducted from upstream to downstream of carrot commodity. However, some programs are failed to support the value chain of carrot so that the improvement of value chain of carrot could not be optimized. Those programs are Agribusiness Sub Terminal, Wortu Cluster, Vitmaka, and Farm Road Improvement Program. The implementation of agropolitan program is not sustainable because of the absence of the budgets of local governments. The program is only implemented for 3 years (2007-2009) so that there are no significant effects of the program on the agricultural sector, especially for carrot commodity.*

**Keywords:** *Carrot, Agropolitan, Suthomadansih, Value Chain.*

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**Abstrak:** Pada tahun 2007, Pemerintah Jawa Tengah memulai pelaksanaan program agropolitan di beberapa kabupaten yang berpotensi di sektor pertanian, Kabupaten Karanganyar salah satunya. Melalui program ini, Kawasan Agropolitan Suthomadansih didirikan. Salah satu komoditas unggulan dari Suthomadansih adalah wortel. Komoditas wortel kemudian dipertimbangkan dalam pelaksanaan program agropolitan, dalam bentuk penyediaan program infrastruktur dan pembangunan masyarakat. Tujuan penelitian ini adalah mengidentifikasi rantai nilai wortel di Suthomadansih. Serta menganalisis pelaksanaan program agropolitan dalam mendukung rantai nilai wortel sebagai komoditas unggulan. Terdapat tiga indikator untuk mengidentifikasi pelaksanaan program agropolitan di Suthomadansih, yaitu: pembangunan infrastruktur pendukung, sistem agribisnis, dan pengembangan sumber daya manusia (Iqbal dan Iwan, 2009). Analisis kualitatif dan kuantitatif digunakan dalam studi dengan tabel kinerja pelaksanaan program dan analisis rantai nilai sebagai alat analisis. Berdasarkan hasil analisis rantai nilai wortel, beberapa program pembangunan telah dilaksanakan oleh Pemda Karanganyar melalui program agropolitan dari hulu ke hilir untuk mendukung pengembangan komoditas wortel. Namun, beberapa program gagal mendukung rantai nilai wortel, sehingga peningkatan rantai nilai wortel tidak optimal. Program-program tersebut antara lain pembangunan sub terminal agribisnis, Klaster Wortel, vitmaka (bibit wortel), dan program jalan tani. Pelaksanaan program agropolitan tidak berkelanjutan karena tidak adanya anggaran dari Pemerintah Daerah. Program agropolitan hanya dilaksanakan selama 3 tahun (2007-2009), sehingga tidak ada efek signifikan dari program agropolitan terhadap sektor pertanian, terutama untuk komoditas wortel.

**Kata Kunci:** Wortel, Agropolitan, Suthomadansih, Rantai Nilai.

## Introduction

In 2007, Central Java Government has been starting the implementation of agropolitan program in some regencies that have that has the potential in the agriculture sector, Karanganyar Regency is one of them. Through this program, Suthomadansih was established in Karanganyar Regency. The leading commodity of agriculture from Suthomadansih is vegetable and fruit. It is possible due to the location of Suthomadansih on the slopes of Lawu Mountain. One of the leading commodities from Suthomadansih is carrot commodity. Carrot commodity is then taken into consideration in the implementation of agropolitan program, in form of provision of infrastructure and community development programs.

The implementation of the agropolitan program in Karanganyar was originally initiated from farmer groups as named Taman Sari in Tawangmangu District at 2006. The action is then followed up by Kimpraswil (Settlement and Regional Infrastructure Board) of Central Java Province by establishing agribusiness sub terminal in Tawangmangu District, and establishing of agribusiness sub terminal in Karangpandan District, Ngargoyoso District, and Jenawi District in the following year. Development budget of agropolitan program comes from both of Government of Central Java Province and Local Government of Karanganyar Regency. The implementation of the agropolitan program is conducted over three years (2007-2009), because the Government of Central Java Province no longer provides funding in 2010. Meanwhile, the Local Government of Karanganyar Regency also uses the budget for other agricultural programs. However, the following programs from Department of Agriculture of Karanganyar Regency still support the agropolitan program.

There are several previous researchers focusing in agriculture development in Karanganyar Regency, especially for carrot commodity. But, there is no available research focuses in carrot value chain. Research study of carrot value chain will show the cultivating

process of carrot commodity in every step from on-farm (upstream) to off-farm (downstream). As well as to explain how the carrot as the leading commodity gives contribution in the development process of Suthomadansih Agropolitan Area. In addition, the research study is expected to analyze how the implementation of agropolitan program supports the value chain of carrot as leading commodity in Suthomadansih Agropolitan Area. Thus, the problem will be discussed in this study is "How the value chain of carrot in Suthomadansih is and what the contribution of agropolitan program in supporting the value chain of carrot as leading commodity in the development process of Suthomadansih are."

## **Research Method**

In order to conduct the research entitled "Value Chain of Carrot Commodity in Suthomadansih Agropolitan Area in Karanganyar Regency," quantitative method is chosen as the research approach. The quantitative research uses scientific principles, concrete, empiric, measurable, rational and systematic as research based. Meanwhile, qualitative data is also needed to support the quantitative research to conduct the analysis. Sample are actors who involve in the cultivating process of carrot commodity in Suthomadansih Agropolitan Area. Therefore, some samples are local farmer, farmer group, actors of carrot home industry, carrot collectors, and carrot retailer, as well as Local Government and NGO's as enabler of the carrot value chain.

There are two sampling techniques used to conduct the research study, purposive sampling and snowballing sampling. Through the purposive sampling, the sample of research study is only people who involved in carrot value chain. They are called as a key person who has a role in cultivating process of carrot commodity. The second technique is snowball sampling. Snowball sampling is a determining technique of sample that is started with a small number, and then become bigger than before (Sugiyono, 2008). The field interview of the research study will be ended once the researcher believes that the information he obtains is sufficient to conduct the analysis.

In regard with the title of this research, value chain analysis is used to gain data information data information from the field. Based on onion research done by FBC in Nepal (2008), there are five stages to conduct value chain analysis, as follow:

1. Identify the sequencing activity of carrot cultivating process;
2. Compose the value chain map based on the result of the first stage;
3. Analysis of carrot value added;
4. Defining the function and actors in the value chain map;
5. Defining the roles of enablers.

The second analysis is aimed to identify how the implementation of agropolitan program in Suthomadansih supports the value chain of carrot as the leading commodity. The description analysis is used to conduct the analysis. According to Iqbal and Iwan (2009), there are three variables That should be analyzed; the development of supporting infrastructure, agribusiness system, and development of human resource. Matrix comparison is chosen to identify the contribution of agropolitan program to value chain of carrot. The table below describes how to conduct the matrix comparison of implementation of agropolitan program.

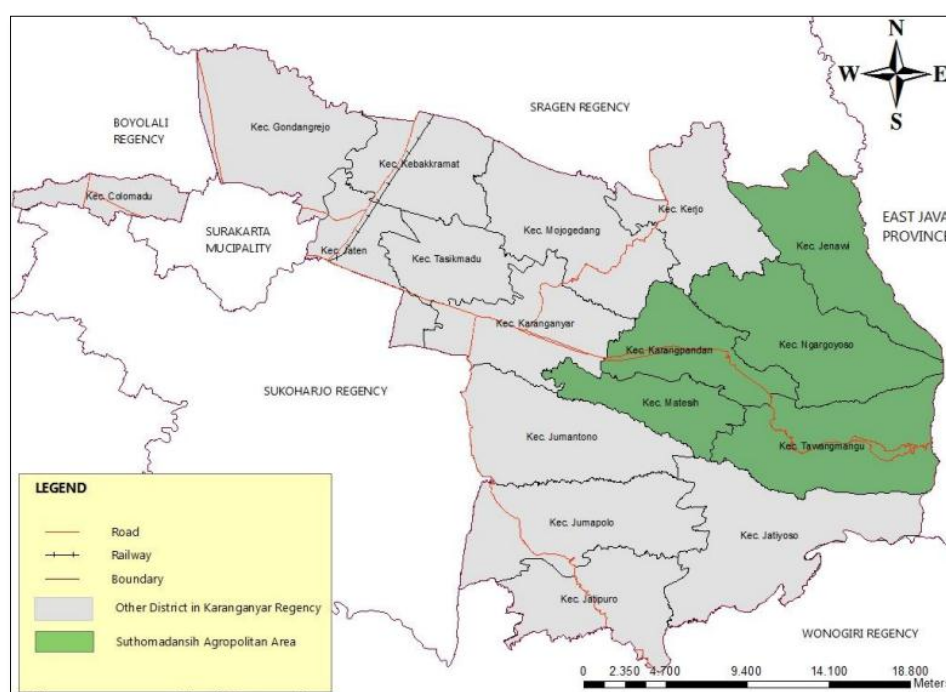
**Table 1. Performance Of The Implementation Of Agropolitan Program In Suthomadansih**

No	Variables	Expectation	Reality	Contribution to value chain of carrot
1	The development of supporting infrastructure	The target of the program in early of the implementation of agropolitan program	The achievement of variable recently	How the variable gives contribution in the development of carrot value chain
2	Agribusiness system			
3	Development of human resource			

Source: analysis, 2014

### Overview of Suthomadansih Agropolitan Area

Suthomadansih as agropolitan area of Karanganyar Regency consists of five districts. They are Tawangmangu District, Karangpandan District, Jenawi District, Ngargoyoso District, and Matesih District.



Source: Local Planning Board of Karanganyar Regency, 2012

**Figure 1. Map of Suthomadansih Agropolitan Area**

Agropolitan program had been implemented in Suthomadansih Agropolitan Area since 2007 to 2009. Department of Agriculture of Karanganyar Regency was the government institution that conducted the program. As a multisectoral program, Local Planning Board of Karanganyar Regency and Department of Industry and Commerce of Karanganyar Regency also involved in this program.

As a program based on the development from below concept, agropolitan program should be initiated by local government, in this case Government of Karanganyar Regency. Instead of Local Government, the initiative was brought by Farmer Group as named Taman Sari from Tawangmangu District in 2006. Then, in that year, Kimpraswil

(Settlement and Regional Infrastructure Board) of Central Java Province surveyed Tawangmangu District with an assumption that the district has potential in vegetable and fruit commodity. In the following year, at 2007, Kimpraswil of Central Java Province started the establishment of Agribusiness Sub Terminal at Tawangmangu District. The construction funding came from Kimpraswil of Central Java Province while the site was provided by Local Government.

## Analysis

There are two analyses in chapter four. The first analysis is about value chain analysis of carrot commodity. By conducting this analysis, the sequencing process of carrot cultivating in Suthomadansih Agropolitan Area, from on-farm (upstream) to off-farm (downstream) will be depicted. The second analysis will investigate how the implementation of agropolitan program in Suthomadansih Agropolitan Area supports the value chain of carrot.

### *Value Chain Analysis of Carrot*

There are five stages to conduct a value chain analysis of carrot commodity (FBC, 2008). The first is identifying the sequencing activity of carrot cultivating process. Second, compose the value chain map based on the result of the first stage. Third, analyze the value added of carrot commodity. Fourth, define the actors and the function in the value chain map. Fifth, define the roles of each enabler.

#### 1. Identifying the Sequences Activity of Carrot Cultivating Process

The carrot cultivating process in Suthomadansih Agropolitan Area is started from the on-farm activity (upstream) to off-farm activity (downstream). There are two activities recognized as the derivative product of carrot: carrot seed production (Vitmaka) and instant carrot home industry (Worta). The seeding process (Vitmaka) includes in the on-farm activity. Meanwhile, the home industry of instant carrot (Worta) is defined as part of the off-farm activity. These two derivative products are produced by Tawangmangu's local farmers in Blumbang Village (for Worta Home Industry) and Pancot Village (Vitmaka).

#### 2. Composing the Value Chain Map of Carrot

The result from the first stage is used to compose the value chain map of carrot. The value chain map of carrot will depicts three characteristics: the network structure, the value added, and the governance structure. The network structure shows the vertical and the horizontal dimensions of the carrot value chain map. The vertical dimension is the carrot value chain map it self. While the horizontal dimension shows the relationship among actors in the same chain link (among the farmer, among the collector, etc.). The governance structure shows the role (scope) of institutions as enablers in carrot value chain. Meanwhile, the value added will be depicted in separated diagram.

In the horizontal line, the carrot value chain map shows three components: the functions, the actors, and the enablers. The function refers to some activities occur in carrot cultivating process, from on-farm activity to off-farm activity. The actor refers to people who are involved in carrot cultivating process. While the enabler show some institutions that conduct and give intervention in the sequencing process of carrot cultivating process. The description of carrot value chain map will be shown in the following table.

**Table 2. The Description of Carrot Value Chain Map**

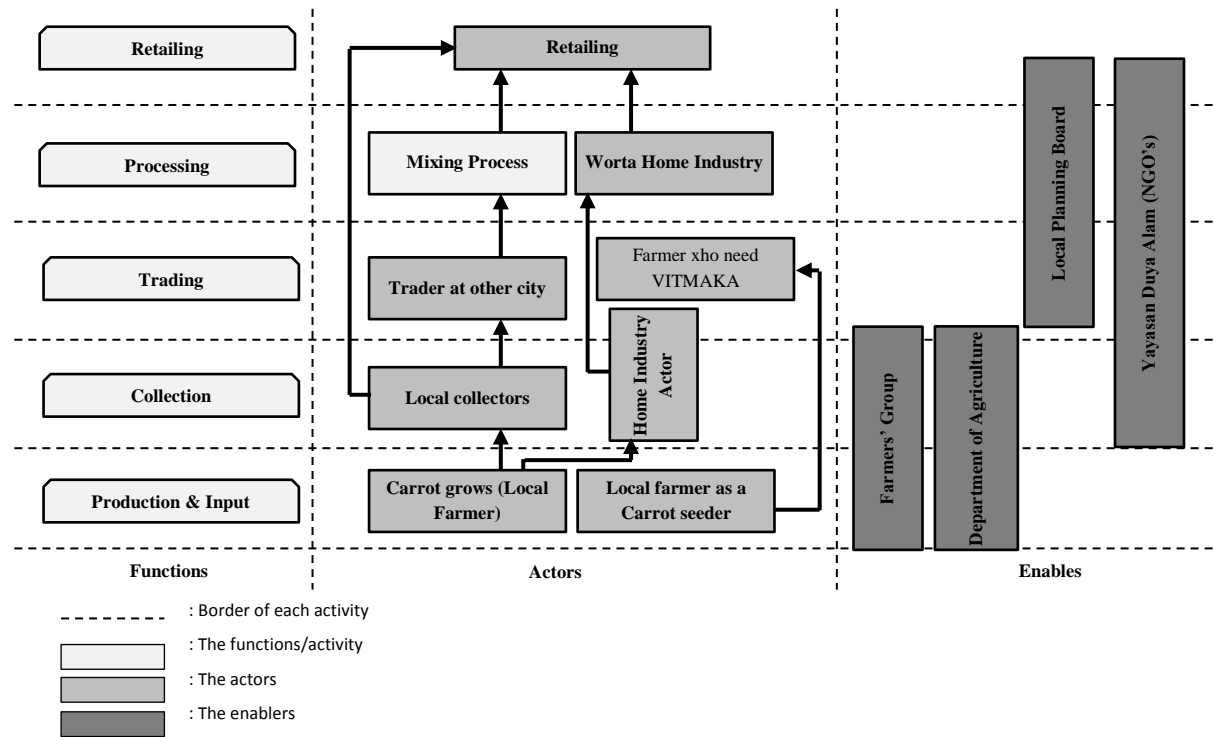
<b>INFORMATION</b>	<b>INPUT</b>	<b>PRODUCTION</b>	<b>COLLECTING</b>	<b>PROCESSING</b>	<b>MARKETING</b>
Product as an input		<ul style="list-style-type: none"> <li>- Seed</li> <li>- Equipment</li> <li>- Fertilizer</li> <li>- Labour</li> </ul>	Fresh carrot	Fresh carrot	<ul style="list-style-type: none"> <li>- Fresh carrot</li> <li>- Carrot seed</li> <li>- Instant carrot</li> </ul>
Product as an output	<ul style="list-style-type: none"> <li>- Seed</li> <li>- Equipment</li> <li>- Fertilizer</li> </ul>	<ul style="list-style-type: none"> <li>- Fresh carrot</li> <li>- Carrot seed</li> </ul>	Fresh carrot	<ul style="list-style-type: none"> <li>- The mix of fresh carrot</li> <li>- Instant carrot</li> </ul>	<ul style="list-style-type: none"> <li>- Fresh carrot</li> <li>- Vitmaka (carrot seed)</li> <li>- Wortu (instant carrot)</li> </ul>
The number of involved people		<ul style="list-style-type: none"> <li>- Based on the data of Karanganyar in figure 2009, the estimation of carrot farmer in Suthomadansih is around 14.764 people (except Matesih District, there is no carrot farmer).</li> <li>- Mostly, carrot farmer in Suthomadansih has ability to produce carrot seed. But only carrot farmers in Tawang-mangu District who concern in the development of carrot seed (Vitmaka). There are 12.024 carrot farmers in Tawangmangu District.</li> </ul>	Local collector in Suthomadansih is usually member of farmer group. There are 25 farmers in farmer group, where the 2 of them are local collectors (8%). If the estimation of local collector is 8% of the number of carrot farmer, the number of local collector in Suthomadansih is 1.181 people.	<ul style="list-style-type: none"> <li>- Based on the data of Karanganyar in figure 2009, the estimation of trader in Suthomadansih is around 1.366 people. The actor that conducts the mixing process of carrot is only trader. Retailer does not do the mixing process.</li> <li>- The production of instant carrot is only conducted by farmer group in Tawangmangu District (Mekar Sari). There are 15 farmers as the member of farmer group.</li> </ul>	<ul style="list-style-type: none"> <li>- Based on the data of Karanganyar in figure 2009, the estimation of trader and retailer in Suthomadansih is around 4.098 people, where the retailer is about 2732 people.</li> <li>- Some local farmers sell the carrot by them selves, but only several farmers. The estimation is about 5% (738).</li> <li>- The 15 members of Mekar Sari's farmer group have roles as retailers to sell instant carrot (Worta).</li> </ul>
Program		<ul style="list-style-type: none"> <li>- Local Government of Karanganyar Regency through Department of Agriculture provides funding for local farmer. The program is PUAP (Pengembangan Usaha Agribisnis Pedesaan). This program is part of PNPB</li> </ul>		<ul style="list-style-type: none"> <li>- In 2007, Local Planning Board of Karanganyar Regency initiated cluster program to accommodate farmer group in Blumbang village. This farmer group (Mekar Sari) has ability to produce instant carrot. The skill obtained from NGO</li> </ul>	<ul style="list-style-type: none"> <li>- Local Planning Board of Karanganyar Regency has a program named "Channeling Business" to support local farmer in to sell carrot. During the implementation of channeling business program, farmer groups are</li> </ul>

INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
		<p>Mandiri Program. Although PUAP is not part of agropolitan program, PUAP has been supporting the implementation of agropolitan program until now. PUAP provides 100 million for farmer group in sub district level (Gapoktan). Then Gapoktan will manage the funding.</p> <ul style="list-style-type: none"> <li>- Department of Agriculture has supported supports the development of carrot seed since 2007. Actually, there is no name label for carrot seed in Karanganyar Regency before the implementation of Agropolitan Program. By starting the agropolitan program, carrot seed in Karanganyar Regency, especially in Suthomadansih has been named as Vitmaka. The label is aimed to enhance the marketability of carrot seed in Suthomadansih. The research and development process of Vitmaka has been conducting until now. Local Government and farmer are still waiting for approval of seed certification from Ministry of Agriculture.</li> </ul>		<p>(Yayasan Duta Alam) that had given mentoring since 2002 to 2007.</p> <ul style="list-style-type: none"> <li>- Wort Cluster obtains wrapping machine from Ministry of Industry and Commerce in 2013 through the Department of Industry and Commerce of Karanganyar Regency.</li> </ul>	<p>invited to attend seminar, exhibition, and auction related to carrot marketing. Through this program, local farmers obtains new market network for carrot. In addition, they also obtain new knowledge in production process of carrot.</p> <ul style="list-style-type: none"> <li>- Kimpraswil of Java Province and Local Government of Karanganyar Regency established agribusiness sub-terminal in four districts in Suthomadansih: Tawangmangu District, Karangpandan, Ngargoyoso, and Jenawi District. The agribusiness sub-terminal is functioned as meeting point between farmer and collector to do transaction.</li> <li>- Department of Agriculture in 2005 initiated "Pasar Jumat" as a special market for the farmer to sell their farming products.</li> </ul>

INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
		<p>Sebelas Maret University is also involved in the development process of Vitmaka.</p> <ul style="list-style-type: none"> <li>- Farming road improvement is a program to improve the quality of farming road. This program has been run during the implementation of agropolitan program.</li> </ul>			
Problems	<ul style="list-style-type: none"> <li>- Chemical fertilizer is supplied from other regencies.</li> <li>- The price level of chemical fertilizer tends to increase.</li> </ul>	<ul style="list-style-type: none"> <li>- PUAP program is only provided for Gapoktan that has good track record in fund managing.</li> <li>- The certification process of Vitmaka has been taking a lot of time, so that Vitmaka has not been sold yet to other regencies.</li> <li>- Local Government does not have sufficient budget to improve all farming roads in whole of Suthomadansih Area. In addition, the program is also stopped in 2009.</li> </ul>		<ul style="list-style-type: none"> <li>- There is limitation in the production process of instant carrot. They are still using manual way to produce instant carrot so that the level production is only 50kg/month.</li> <li>- Conducting the Wortu home industry is not the priority choice of wortu's member. Farming is the first choice, so that there is no rapid progress in the development of Wortu home industry.</li> </ul>	<ul style="list-style-type: none"> <li>- Local farmers tend to sell carrot to local collector rather than selling it by them selves so that they can get money more quickly.</li> <li>- <i>Pasar Jumat</i> as an alternative market for agriculture product now turns into market that sells daily needs.</li> <li>- Local farmers are still producing Vitmaka to fulfill their needs. They do not consider yet to produce in large scale so they could sell the carrot seed.</li> <li>- The construction of Agribusiness sub-terminal is not in line with what the local farmer needs. Local farmer as user of agribusiness sub-terminal was not involved in its construction. Hence, only two agribusiness sub-</li> </ul>



INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
					<p>terminal in Tawangmangu and Ngargoyoso District that are still run/operated recently.</p> <ul style="list-style-type: none"> <li>- Due to the location of agribusiness sub-terminal, most farmers sell their carrot directly to local collector in the field.</li> </ul>
<p>Opportunities</p>	<ul style="list-style-type: none"> <li>- Mostly, local farmers in Suthomadansih are also a breeder. They utilize the waste as organic fertilizer.</li> <li>- Some Gapoktan in Tawangmangu District has initiated to start organic farming. Therefore, local farmer can reduce the dependence on chemical fertilizer.</li> </ul>	<ul style="list-style-type: none"> <li>- Local Government can initiate the cooperation with NGOs to conduct some agriculture programs in Suthomadansih, especially in empowering program. Wortu can be the reference.</li> <li>- Speed up process of certification of Vitmaka.</li> </ul>		<ul style="list-style-type: none"> <li>- Inviting the private sector to join in the development of Wortu. The professional management may be more appropriate to manage Wortu as derivative product of carrot.</li> <li>- There are other derivative products from carrot that can be an alternative way to increase the income of farmer, such as carrot juice, carrot crispy, and carrot noddle.</li> </ul>	<ul style="list-style-type: none"> <li>- There is available market for carrot seed either in inside or outside of Suthomadansih, such as Dieng District in Wonosobo Regency.</li> <li>- Encouraging the local farmer to produce more carrot seed (Vitmaka).</li> </ul>



Source: Analysis, 2014

**Figure 2. Carrot Value Chain Map**

3. Carrot Value Added

Based on the carrot value chain map above, the whole value added the process of carrot commodity in Suthomadansih Agropolitan Area will be depicted in the diagram below. The detailed description about carrot value added will be explained in table 3. Meanwhile, for deep analysis of fresh carrot and its derivative product will be presented in the following analysis.

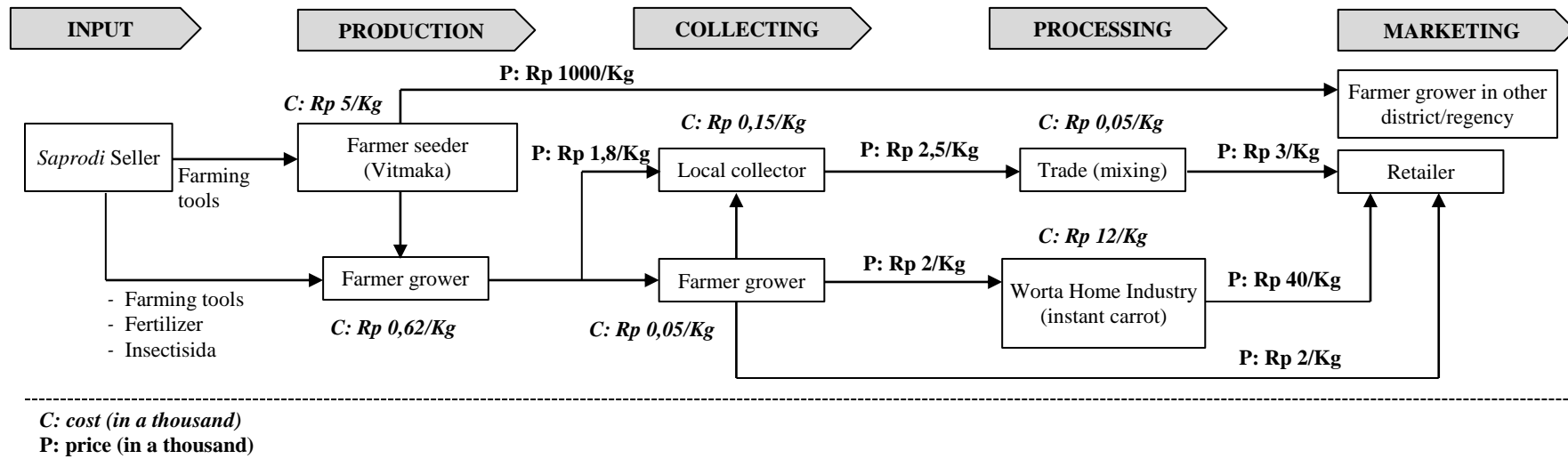


Figure 3. Carrot Value Added

Table 3. Detailed Calculation Of Carrot Value Added

INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
Detailed calculation for fresh carrot		Assumptions			
		Assumptions: the harvesting process is conducted by carrot farmer.	Assumptions: local carrot is only sold to local trader.		
		Cost			
		Carrot farmers spent ten million rupiah/ha to grow carrot. Then they could harvest about 15 ton fresh carrot. Therefore, carrot cost per kg is Rp 670. Here the detail cost: - Seed: Rp 80	Local collectors spent Rp 1.950/kg for carrot. Here the cost detail: - Fresh carrot: Rp 1.800/kg - Washing cost: Rp 100/kg. Transportation: Rp 50/kg.	Local traders spent Rp 2.550/kg for carrot. Here the cost detail: Fresh carrot: Rp 2.500/kg	Local retailers spent Rp 3.100/kg for fresh carrot. Here the cost detail: - Fresh carrot: Rp 3.000/kg - Transportation: Rp 100/kg

INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
		- Saprodi: Rp 370 - Field preparation: Rp 170 - Harvesting: Rp 50			
		Revenue			
		Carrot farmers sell 1 kg carrot to local collector for Rp 1.800.	Local collectors sell 1 kg carrot to local trader for Rp 2.500.	Local traders sell 1 kg fresh carrot to local retailer for Rp 3.000.	Local retailers sell 1 kg fresh carrot to consumer for Rp 3.500.
		Profit Margin			
		Carrot farmer obtains profit Rp 1.130/kg.	Local collector obtains profit Rp 550/kg.	Local trader obtains profit Rp 450/kg.	Local retailer obtains profit Rp 400/kg.
		Total value per year			
		Total production carrot per year is about 114.003 kw (BPS, 2011).			Total value of fresh carrot per year is about Rp 399.010.500
Detailed calculation for carrot seed (Vitmaka)		Assumptions			
		Assumption: - Seeder uses fresh carrot grade A <sup>2</sup> as input. - Five kilograms carrot grade A could produce 0,25 kg Vitmaka. - The price of carrot grade A is Rp 2.000/kg. - Operational cost <sup>3</sup> to process 1kg carrot grade A is Rp 10.000			
		Cost			
		In order to produce 1kg Vitmaka <sup>4</sup> , seeder spent Rp 240.000. Here the detail cost:			

<sup>2</sup> Farmers in Suthomadansih Agropolitan Area typically use grade A carrot in the seeding process. It is aimed to obtain high quality seeds. The difference in the carrot grade lies in the physical size, which is big for grade A (> 250gr), medium for grade B (100gr-200gr), and small for grade C (<100g). In the seeding process, one kilogram of carrots grade A will produce ± 50 grams of carrot seeds (Vitmaka). Carrot grade A can be seen in Annex 2 figure 12.

<sup>3</sup> Operational cost for plastic, seeding house, seeding media (soil), fertilizer, and human resources.

<sup>4</sup> Farmer seeder needs about 4-6 months to produce carrot seed (Vitmaka).

INFORMATION	INPUT	PRODUCTION	COLLECTING	PROCESSING	MARKETING
		- 20 kg carrot grade A: Rp 40.000 - Operational cost: Rp 200.000			
		<b>Revenue</b>			
		Farmer sells 1kg Vitmaka for Rp 600.000.			
		<b>Profit margin</b>			
		Farmer obtains Rp 360.000/kg Vitmaka.			
		<b>Total value per year</b>			
		Area of carrot field is about 726 Ha (BPS, 2011). Farmer needs 1 kg Vitmaka for 1Ha field. Carrot is growth twice a year. The local need of carrot seed per year is about 1.452 Kg.			Total value of Vitmaka per year is about Rp 1.452.000.000
Detailed calculation for Wortá		<b>Assumptions</b>			
		- The price of 1 kg sugar is Rp 10.000 - The price of 1 kg carrot is Rp 2.000			
		<b>Cost</b>			
		Wortá home industries can produce 50kg instant carrot/month. They spent Rp 600.000 to produce 50 kg instant carrot. Here the detail cost: - 50 kg Fresh carrot: Rp 100.000 - 50 kg sugar: Rp 500.000 Production cost of 1 kg instant carrot is Rp 12.000			Local trader and retailer spent Rp 41.000/kg for fresh carrot. Here the cost detail: - Wortá: Rp 40.000/kg - Transportation: Rp 1.000/kg
		<b>Revenue</b>			
		Wortá has been sold for Rp 40.000/kg.			Local trader and retailer sell Wortá for Rp 45.000/kg.

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<b>INFORMATION</b>	<b>INPUT</b>	<b>PRODUCTION</b>	<b>COLLECTING</b>	<b>PROCESSING</b>	<b>MARKETING</b>
		Profit Margin			
		Worta home industry obtains Rp 28.000/kg instant carrot.			They obtain Rp 4.000/kg.
		Total value per year			
		Suthomadansih produces 9.500,25 kw carrots per month. Worta home industry can processes 50 kg fresh carrot per month (0,005%). Worta home industry can produces 600 kg instant carrot per year			The total value of instant carrot per year is about Rp 30.000.000

Source: Analysis, 2014

#### 4. Defining the Function and Actors in the Value Chain Map

- *Carrot Farmer*

Carrot farmer in Suthomadansih Agropolitan Area has two functions: as carrot grower and as carrot seeder. Mostly, carrot farmers cultivate their own farmland, while the rest rent the farmland from other farmers who have large farmland. Rental price is calculated based on the total land area used per year. For some carrot farmers, farmland is not the only media to plant the carrot. They also utilize the home yard to cultivate the carrot. Carrot farmers also utilize the home yard as a seeding laboratory.

Besides as carrot growers and seeder, some carrot farmers, particularly in Blumbang Village, Tawangmangu District also have the roles as home industry actors. They are members of the Mekarsari Farmer Group, producing instant carrot (Worta).

- *Carrot Home Industry Actors*

As mentioned above, some carrot farmers in Blumbang Village, Tawangmangu have roles as home industry actors. They produce instant carrot namely Worta. Worta is not only as the product name, but also as the name of carrot home industry's cluster. Worta Cluster was established by Local Planning Board of Karanganyar Regency, in line with the implementation of Agropolitan Program in 2007.

For the member of Mekarsari Farmer Group, Worta Home Industry also gives a chance to get a higher carrot price than the market price. Worta Home Industry usually buys carrot from the members. It sets the fixed price, i.e. Rp 2.000/Kg for the carrot bought from the members. When the market price is higher than the fixed price, Worta Home Industry will buy in accordance with the market price. When the market price is lower than the fixed price, Worta Home Industry will buy at the fixed price.

- *Local Collectors*

Local collectors are directly involved in buying carrots from local farmers in Suthomadansih Agropolitan Area. They are also selling carrots to traders or retailers in the local market in Karanganyar Regency and outside Karanganyar Regency, such as Sragen Regency, Boyolali Regency, Surakarta Municipality, Sukoharjo Regency, Sleman Regency, and Klaten Regency.

- *Traders*

Traders often buy carrot from the local collectors and directly from the carrot farmers in the vicinity. For traders from other cities, they often get supplies from the local collectors. In running their business, some traders mix carrots from Suthomadansih with carrots from other regencies. Traders also supply retailers in traditional markets. Therefore, traders combine the functions of collecting and selling their carrots in the market.

- *Retailers*

There are numerous carrot retailers in Suthomadansih Agropolitan Area who caters to the household consumers. These retailers also sell other vegetables and other items. Retailers on motorcycle and bicycle also sell carrot and another vegetable door to door. In addition, retailers also sell carrot in traditional markets surrounding the Suthomadansih Agropolitan Area.

#### 5. Defining the Roles of Enablers

Local Government and Non-Governmental Organizations play important roles in moving the carrot commodity along the value chain. The functions and roles of the enablers, as depicted in the Carrot Value Chain Map (Figure 4.3) are described as follows:

**Table 4. Roles of Enablers**

<b>Enablers</b>	<b>Role</b>
Department of Agriculture	<ul style="list-style-type: none"> <li>- Implementing the agropolitan program.</li> <li>- Providing the training and mentoring related to farm cultivation.</li> <li>- Implementing the PUAP program as a funding program for farmer through Gapoktan (The United of Farmer Group in village level).</li> <li>- Initiating the “Pasar Jumat” as a special market for the farmer to sell their farming product.</li> </ul>
Department of Industry and Commerce	<ul style="list-style-type: none"> <li>- Providing the training of post harvesting process, i.e.: packaging, processing product.</li> <li>- Providing the network market for carrot trading.</li> <li>- Providing wrapping machine for Wortu home industry.</li> </ul>
Local Planning Board	<ul style="list-style-type: none"> <li>- Establishing the agropolitan network among the agropolitan areas in Java Island, particularly in Central Java Province.</li> <li>- Establishing the Wortu Cluster to promote the Carrot Home Industry in Suthomadansih Agropolitan Area.</li> <li>- Providing equipment for producing instant carrot.</li> </ul>
Yayasan Duta Alam (NGO)	<ul style="list-style-type: none"> <li>- Providing training and assistance to farmer groups in Blumbang Village for instant carrot production.</li> <li>- Providing equipment for producing instant carrot.</li> </ul>
Sebelas Maret University	<ul style="list-style-type: none"> <li>- As a place where laboratory test of Vitmaka takes place.</li> </ul>
Gapoktan (the united of farmer group in village level)	<ul style="list-style-type: none"> <li>- As farmer association to channel funds from PUAP.</li> </ul>
Farmer’s Group	<ul style="list-style-type: none"> <li>- As a media for farmers to gain knowledge related to cultivating process.</li> <li>- Providing information related to farmer commodity prices</li> </ul>

*Source: Analysis of researcher, 2014*

### The Findings

There are some findings based on the value chain analysis of carrot commodity in Suthomadansih Agropolitan Area. The findings are related to program, problem, and opportunity.

1. Development program from Local Government has been conducted from upstream to downstream of carrot commodity production. However, some programs failed to support the value chain of carrot so that the improvement of value chain of carrot could not be optimized. One of the failed programs is agribusiness sub-terminal.
2. There are potential markets for carrot seeds, especially in Dieng District, Wonosobo Regency. However, Vitmaka has not received certification from Ministry of Agriculture yet so that the selling with label Vitmaka could not be done.
3. The biggest profit margin is derived from instant carrot that is about 233% then followed by farmer seeder (Vitmaka) which is about 150%. 12.039 people are directly involved and receive the profits of carrot commodity. However, mostly farmers only produce carrot seed for fulfill their need. Therefore, the number of people who is directly involved and receives the profit margin may decrease.
4. Although Wortu has the biggest profit margin, the production level is still low. Thus, Wortu has not been one of the alternative ways of getting extra income for the farmers yet. In the other hand, Vitmaka has market potency both inside and outside



the area of Karanganyar Regency so that it can serve as alternative income for farmers.

5. The potential money flowing from carrot commodity per year is about Rp 1.881.010.500. Vitmaka has the highest potency to lift up the economic condition of Suthomadansih (Rp1.452.000.000).
6. The development of agribusiness sub-terminal does not meet the need of local farmer. A local farmer was not involved in the development of agribusiness sub-terminal.

**Table 5. Performance of The Implementation of Agropolitan Program In Suthomadansih**

No.	Variables	Expectation	Reality	Contribution to value chain of carrot
1.	<b>The Development of Supporting Infrastructure</b>			
	Agribusiness sub-terminal	<ul style="list-style-type: none"> <li>- This facility is aimed as new meeting point between farmer and trader to do transaction. Not only local traders from Suthomadansih, the sub-terminal can also be used by traders from other regions.</li> <li>- Tax from agribusiness sub-terminal will be used as local income of Karanganyar Regency.</li> </ul>	<ul style="list-style-type: none"> <li>- Local and provincial governments built four terminals, but only two terminals that are still functioning.</li> <li>- Revenue from the Agribusiness Sub-terminal currently only revolves around 2.5 million rupiah per month, so it has never been considered as local income of Karanganyar Regency.</li> </ul>	<ul style="list-style-type: none"> <li>- There is carrot washing achine in Agribusiness sub-terminal which is still functioning, so the traders or the collectors can use it.</li> </ul>
	Farm road improvement program	<ul style="list-style-type: none"> <li>- This program is aimed to improve the accessibility of local farmers in Suthomadansih to their farmland.</li> </ul>	<ul style="list-style-type: none"> <li>- This program is not implemented on the entire agropolitan area. The program is only implemented in some locations with the length of the road is not further than a kilometer for each district.</li> </ul>	<ul style="list-style-type: none"> <li>- This program fosters the participation of farmers to participate in the development/ improvemen of the farming road.</li> </ul>
2.	<b>Agribusiness System</b>			
	The existence of financial institutions	<ul style="list-style-type: none"> <li>- to provide loans to farmers with easy terms.</li> </ul>	<ul style="list-style-type: none"> <li>- There is no financial institution</li> </ul>	<ul style="list-style-type: none"> <li>- There is no contribution to value chain of carrot.</li> </ul>
	Partnership building (channeling business)	<ul style="list-style-type: none"> <li>- To develop the networkfor expanding the marketarea of carrot.</li> </ul>	<ul style="list-style-type: none"> <li>- Local overnment invites Farmer Groups in Suthomadansih to visit other farmer groups in outside regions of Karanganyar Regency.</li> </ul>	<ul style="list-style-type: none"> <li>- Local farmer has new network with other farmer groups. But it does not give any influence yet to the marketing process.</li> </ul>
3.	<b>The Development of Human Resource</b>			
	Cluster program of Wort	<ul style="list-style-type: none"> <li>- to provide production tools to produce instancarrot.</li> <li>- To promote Wort to other regencies.</li> </ul>	<ul style="list-style-type: none"> <li>- Wort Cluster has been established since 2007.</li> <li>- Wort Cluster obtains fund to buy production tools from Local Planning Board. Department of Industry</li> </ul>	<ul style="list-style-type: none"> <li>- Wort Cluster obtains production tools to produce instant carrot.</li> </ul>

No.	Variables	Expectation	Reality	Contribution to value chain of carrot
			also gives wrapping machine to Wortu Cluster. - Wortu Cluster still cannot find appropriate market for selling their instant carrot.	
	Empowering program to develop local carrot seeds (Vitmaka)	- To support farmers in developing the original carrot seeds from Suthomadansih. - To get the certification of carrot seeds so that they can be marketed widely To promote Vitmaka to other regencies.	- The seed certification has not been obtained yet. - Vitmaka is only used by local farmers in Suthomadansih.	- Vitmaka has not been sold yet to other regencies.
	Training for carrot processing	- to encourage local farmer to find new alternatives to sell carrot.	- Due to the market condition, farmer is still unwilling to process carrot into other products.	- Local farmer obtains references how to process fresh carrot into other products, but they still prefer to sell fresh carrot.
	The agricultural extension program	- To increase the quality and quantity of carrot commodity.	- In fact, without the empowering program, local farmer can increase the quality and quantity of carrot. However, local farmers can obtain more knowledge to cultivate their farming land.	- Through this program, local farmer has media to solve the problem related to their farming activity.

Source: Analysis, 2014

## Conclusion

Based on the value chain of carrot commodity in Suthomadansih, development program from the local government through the agropolitan program has been conducted from upstream to downstream. However, some programs failed to support the value chain of carrot commodity so that the improvement of value chain of carrot commodity could not be optimized.

The implementation of agropolitan program is not sustainable because of the lack of the budgets of local governments. The program is only implemented for 3 years (2007-2009) so that there are no significant effects of the program on the agricultural sector, especially for carrot commodity. The programs that are parts of the agropolitan program are Agribusiness Sub-Terminal, Wortu Cluster, Vitmaka, and Farm Road Improvement Program.

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