



vegIMPACT

## *Land tenure in the lowlands of Cirebon, Brebes and Pekalongan, Indonesia*

*Witono Adiyoga and Herman de Putter*



vegIMPACT

Improved Vegetable Production and Marketing for small farmers to Increase the Food Security status and to promote Private Sector Development in Indonesia



*vegIMPACT is a program financed by The Netherlands' Government promoting improved vegetable production and marketing for small farmers in Indonesia, contributing to the food security status and private sector development in Indonesia. The program builds on the results of previous joint Indonesian-Dutch horticultural development cooperation projects and aligns with recent developments in the horticultural private sector and retail in Indonesia. The program activities (2012 – 2016) include the Development of Product Market Combinations, Strengthening the Potato Sector, Development of permanent Vegetable Production Systems, Knowledge Transfer and Occupational Health.*

*Wageningen University & Research, The Netherlands:*

- *Wageningen Plant Research, Lelystad*
- *Wageningen Centre for Development Innovation (CDI), Wageningen*
- *Wageningen Plant Research, Wageningen*
- *Wageningen Economic Research, Den Haag*

*Wageningen University & Research*

*Contact person: Huib Hengsdijk, [huib.hengsdijk@wur.nl](mailto:huib.hengsdijk@wur.nl)*

*Indonesian Vegetable Research Institute (IVEGRI, Indonesia)*

*Contact person: Witono Adigoya, [balitsa@balitsa.org](mailto:balitsa@balitsa.org)*

*Fresh Dynamics (Indonesia)*

*Contact person: Marcel Stallen, [info@freshdynamics.biz](mailto:info@freshdynamics.biz)*

*Website: [www.vegIMPACT.com](http://www.vegIMPACT.com)*

© 2017 Wageningen University & Research, Wageningen Plant Research, P.O. Box 16, 6700 AA Wageningen, The Netherlands; T +31 (0)317 48 07 00; [www.wur.nl/plant-research](http://www.wur.nl/plant-research).

Stichting Wageningen Research. All rights reserved. No part of this publication may be reproduced, stored in an automated database, or transmitted, in any form or by any means, whether electronically, mechanically, through photocopying, recording or otherwise, without the prior written consent of Stichting Wageningen Research.

DLO is not liable for any adverse consequences resulting from the use of data from this publication.

# *Land tenure in the lowlands of Cirebon, Brebes and Pekalongan, Indonesia*

*Witono Adiyoga and Herman de Putter*

## Contents

1. Introduction.....	5
2. Methodology .....	6
3. Results .....	7
3.1 Farmer tenants.....	7
3.2 Land owners .....	18
3.3 Village heads.....	20
4. Discussion and conclusions .....	24
5. Reference.....	26
6. Annex I. Survey Protocol and Questionnaire.....	27

## 1. Introduction

As broadly and holistically defined by FAO (1995), land is a delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface including those of the near-surface, climate, the soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes, and swamps), the near-surface sedimentary layers and associated groundwater reserves, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, artificial water storage or drainage structures, roads, buildings, etc.). 'Agricultural land', in general, is the land resource upon which agriculture takes place providing the physical and biological environment to grow food products. The quality of agricultural land, i.e. soil and climate characteristics, determine the amount food and type of food products that can be produced. Although agricultural land is primarily required for the production of food for human and animal consumption, agricultural activities also include the production of plants for fibre and fuels (including wood), and for other organically derived products such as pharmaceuticals (Place and Meybeck, 2013).

Land is one the main production factors in agriculture next to labour and capital. Therefore, the economic prosperity of a country is closely linked with the quality and quantity of the natural resource base (Metzemakers and Louw, 2005). Land provides a link between hydrological, atmospheric, and climatic systems. In terms of economics, land can be viewed as scarce good (space) for locating economic production activities, infrastructure and dwellings, but land is also a productive asset as it provides water and nutrients for crop production. As such, land represents an economic value and asset. On a social level, ownership of land is a valuable property, source of prestige and an organizing principle for socio-economic relationships. The area of agricultural land is not constant over time. Human intervention, notably the reclamation of natural areas, increases the agricultural area, while erosion, flooding and transformation to other uses reduce the area with agricultural land (Hubacek and van den Bergh, 2002).

In developing country such as Indonesia, population pressure is linked to (i) smaller land holdings of most smallholder farms; (ii) continuous cultivation of fields, contributing to land degradation and unsustainable forms of agricultural intensification; (iii) the rise of land rental prices and changes in land allocation institutions; and (iv) the challenges that Indonesia is currently experiencing in achieving inclusive forms of agricultural income growth (Jayne et al. 2014).

Many vegetable farmers in Cirebon, Brebes and Pekalongan in the lowlands of Java produce crops on rented land, typically for short periods (one year). Information of farmers suggests that the rental price of land increases while the land availability for renting decreases. The vegIMPACT program works among others on the development of permanent vegetable production systems to increase vegetable production per unit of land area, thus directly responding to the issue of increased farm-land scarcity. These new permanent systems demand an investment of the land manager but it is expected that the land quality increases over time. It is anticipated that introduction of permanent vegetable systems at a large scale will require good understanding of farmers' production circumstances, including the socio-institutional setting related to land tenure that may affect adoption of such vegetable systems. Therefore, an explorative survey was carried out in Cirebon, Brebes and Pekalongan in 2016 to gain a better understanding of the current land tenure system and the involved actors in this system, i.e. farmers, land owners and village heads.

## 2. Methodology

Both the locations (Cirebon, Brebes and Pekalongan) and the respondents (farmers, land-owners, and village-heads) were selected purposively by the research team based on available information relevant to the study. Respondents were interviewed in 2016 by a team of enumerators using a semi-structured questionnaire that consisted of both open and closed-ended questions (Annex I). Three different questionnaires were developed for farmers, land-owners, and village-heads. Each respondent was interviewed no more than one-half hour. Collected data was analysed by using descriptive statistics. From each location, the same number of respondents was selected (23 respondents). Hence, the total number of respondents interviewed was 69 persons (Table 2.1).

*Table 2.1. Distribution of survey respondents in Cirebon, Brebes and Pekalongan.*

Location	Farmers	Land-owner	Village Head	Total
Cirebon	15 <sup>1)</sup>	5	3	23
Brebes	15	5	3	23
Pekalongan	15	5	3	23
Total	45	15	9	<b>69</b>

1) Comprising ten farmers that participated in other vegIMPACT activities and five other farmers.

### 3. Results

#### 3.1 Farmer tenants

The family size and age composition of family members was the same in the three locations (Table 3.1; 3.2).

*Table 3.1 Average number of family members besides the farmer in age and gender categories and in Brebes, Cirebon and Pekalongan, numbers in headings refer to age cohorts.*

	<b>Total household members</b>	<b>Male&gt;16</b>	<b>Male&lt;16</b>	<b>Female&gt;16</b>	<b>Female&lt;16</b>
Brebes	3.7	1.2	0.5	0.8	0.2
Cirebon	4.1	1.4	0.4	0.9	0.4
Pekalongan	3.7	1.4	0.3	0.7	0.3

Table 3.2 indicates that especially female family members in Brebes and Pekalongan worked off-farm. The majority of the male members only works off-farm for a limited period per year, on average less than one month per year. However, the high Lsd indicates that few farmers worked much more off-farm. In our survey, the farmers in Brebes were about 8-9 years younger than farmers in Cirebon and Pekalongan.

*Table 3.2 Total number of household members excluding farmer, off-farm male employment, off-farm female employment and age of farmer (household head).*

	<b>Number of family members (person)</b>		<b>Off-farm male employment (days per year)</b>		<b>Off-farm female employment (days per year)</b>		<b>Age</b>	
Brebes	2.7	a	16.0	a	73.5	a	38.4	a
Cirebon	3.1	a	0.0	a	22.8	a	47.4	b
Pekalongan	2.7	a	12.8	a	87.1	a	46.9	ab
Lsd	0.99		27.6		89.6		8.6	
F pr.	n.s.		n.s.		n.s.		<0.10	

Both Table 3.3 and Figure 3.1 show that land rent prices in Brebes were the highest and that the land rent in Pekalongan lowest, approximately 3.5 times lower than in Brebes and twice as low as in Cirebon. This indicates that the demand for land in Brebes was higher than in Cirebon and Pekalongan.

Table 3.3 Mean, minimum, maximum of rent price of land in Brebes, Cirebon and Pekalongan.

	n	Mean (IDR/m <sup>2</sup> /month)	Minimum (IDR/m <sup>2</sup> /month)	Maximum (IDR/m <sup>2</sup> /month)
Brebes	15	239	182	417
Cirebon	16	141	83	225
Pekalongan	15	68	25	143

In Pekalongan the mean rent price is not only lower but also the variation is less than at the other two locations (Fig. 3.1). The red x in Fig 3.1 indicates outliers for Brebes and Pekalongan, while the numbers 28 and 46 refer to the farm identification number used in the survey.

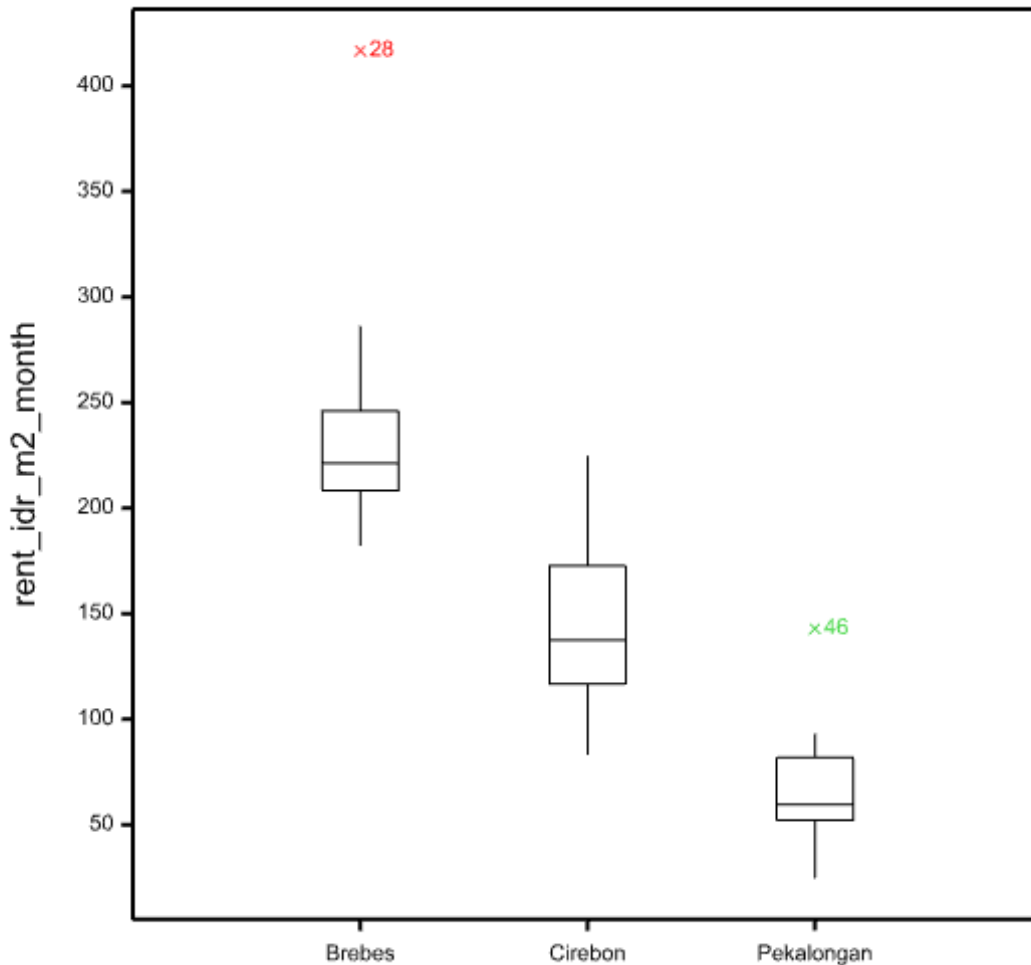


Figure 3.1 Land rent prices in Brebes, Cirebon and Pekalongan (in IDR/m<sup>2</sup>/month).

Many factors may influence farmers' decision to rent land. Table 3.4 shows that water availability was the most important factor considered by farmers affecting their decision to rent land. The second most important factor was soil fertility followed by the rent price, accessibility, availability of other land, land size, land available as planned, and others (rent payment method – after harvest, land previously used for shallot – land preparation cost saving, familiar with the land owner, and the land location was quite close to own farm). In Cirebon, tenants identified more factors affecting the decision to rent land than in Brebes and Pekalongan.



*Table 3.4 Factors influencing farmers' (tenants) decision to rent land, their importance according the farmers in Brebes, Cirebon and Pekalongan, and ranking based on number of respondents.*

<b>Factors affecting tenants' decision to rent a certain plot <sup>1)</sup></b>	<b>Brebes (# of farmers)</b>	<b>Cirebon (# of farmers)</b>	<b>Pekalongan (# of farmers)</b>	<b>Total</b>	<b>Ranking</b>
Accessibility	4	7	4	15	4
Water availability	9	13	6	28	1
Soil fertility	6	9	6	21	2
Appropriate land size (large enough)	1	6	2	9	6
Rent price	4	6	6	16	3
Land available as planned (timing)	2	3	2	7	7
Availability of other land	6	4	5	15	4
Other factors (rent payment, land previously used for shallot saves land preparation, existing relationship with / trust in land owner, location is close to own farm)	2	3	0	5	8
<b>Total</b>	<b>34</b>	<b>51</b>	<b>31</b>	<b>116</b>	

<sup>1)</sup> The interviewed tenants could mark more than one factor.

Commonly, farmers rent land for 12 months. About half of the surveyed farmers are willing to rent land for a longer period, i.e. 2 to 5 years. Table 3.5 shows the reasons for renting land for shorter periods. Land owner's permission to rent land for a long period and the availability of working capital were the two main barriers for farmers to rent land for longer periods. Other important reasons were farmers' concern regarding soil fertility (degradation) and (less) flexibility, i.e. farmers make a long-term commitment and cannot change easily their livelihood when renting land for a longer period.

**Table 3.5** *Farmer' willingness and reasons for renting land for short periods, number of farmers agreeing with the statement and ranking based on number of respondents.*

<b>Willingness to rent a land for longer period (2-5 years):</b>	<b>Brebes (# of farmers)</b>	<b>Cirebon (# of farmers)</b>	<b>Pekalongan (# of farmers)</b>		
yes	8	8	6		
no	7	8	9		

<b>Reasons for not renting land for a longer period (2-5 years):</b>	<b>Bre</b>	<b>Cir</b>	<b>Pek</b>	<b>Total</b>	<b>Rank</b>
Land owners do not allow renting land for a long period	3	4	2	9	1
High uncertainty, mainly with regard to available working capital	2	2	5	9	1
A relatively short period of land rent allows more flexibility (on and off-farm employment)	1	4	0	5	3
Soil fertility degradation when renting land for long period	2	3	1	6	2
Short renting period allows to negotiate a better deal with other land-owners	1	2	0	3	4
Possibility of finding land with better access (closer to home or closer to main road) or higher soil fertility	1	1	0	2	5
Others (village regulation, less profitable compared to one year renting, land will be used for sugarcane in the near future)	1	0	0	1	6

In Brebes, most farmers (93%) rented one plot of land, while in Cirebon and Pekalongan about 35-40% of farmers rented two or three plots (Table 3.6). This difference may be related to the higher price of rented land in Brebes compared to Cirebon and Pekalongan.

**Table 3.6** *Number of rented plots by farmers in Brebes, Cirebon and Pekalongan.*

<b>No of rented plots</b>	<b>Brebes</b>	<b>Cirebon</b>	<b>Pekalongan</b>
1	14	9	9
2	1	5	6
3	0	2	0

Pearson chi-square test 9.02, probability 0.042.

The three locations differed little in the number of plots owned by farmers (Table 3.7). More than half of the respondents (67%) did not own land, 20% of the farmers owned one plot and 13% owned one or more plots, especially in Pekalongan.

Table 3.7 Number of plots owned by farmers in Brebes, Cirebon and Pekalongan.

No. of parcels	Brebes	Cirebon	Pekalongan	Total
0	13	10	8	31
1	2	3	4	9
2	0	2	0	2
3	0	0	1	1
4	0	1	1	2
5	0	0	1	1

Pearson chi-square test, probability 0.343.

The minority of farmers with land hardly rent out own land (Table 3.8). The few who rented out land did this because of a shortage of resources (capital, labour).

Table 3.8 Reasons for renting out own land by farmers in Brebes, Cirebon and Pekalongan, and the number of farmers mentioning a reason.

Renting out owned land:	Brebes	Cirebon	Pekalongan
no	13	13	15
yes	2	3	0

Pearson chi-square test, probability 0.326 ( $p < 0.05$ ), not significantly different

Reasons for renting out:	Brebes	Cirebon	Pekalongan
Does not rent out land	13	13	15
Insufficient resources to work all land	-	3	-
Land with low soil fertility or poor access	1	-	-
Need for cash money	1	-	-

Some farmers rented out the land that they rented (sub-leasing), especially in Brebes and Cirebon (Table 3.9). These farmers subleased the land because usually they needed urgent cash. In some cases, subleasing was done by a so-called land-broker who secured a large acreage. Farmers renting from this broker are therefore subleasing and not dealing directly with the land owner.

Table 3.9 Number of farmers subleasing rented land in Brebes, Cirebon and Pekalongan.

	Brebes	Cirebon	Pekalongan
no	11	12	15
yes	4	4	0

Farmers in the three study locations rent up to three plots (Table 3.6). The average size of the rented plots was largest in Cirebon and smallest in Brebes, probably related to the high land prices in Brebes (Table 3.10). The average acreage of total rented fields was also smallest in Brebes and largest in Cirebon. Statistical analysis indicated that rented land sizes were significantly different.

Table 3.10 Average size and total size of rented land in Brebes, Cirebon and Pekalongan.

<b>Size of individual fields per location</b>				
Location	number of fields	Average (m <sup>2</sup> )	Minimum (m <sup>2</sup> )	Maximum (m <sup>2</sup> )
Brebes	45	1,725	800	3,200
Cirebon	48	6,848	1,400	20,000
Pekalongan	45	2,695	350	25,000
<b>Total rented land per farmer per location</b>				
Location	number of farms	Average (m <sup>2</sup> )	Minimum (m <sup>2</sup> )	Maximum (m <sup>2</sup> )
Brebes	15	1,840	800	3,200
Cirebon	16	10,700	1,400	40,000
Pekalongan	15	3,594	350	25,600
Lsd		5,221		
F pr.		< 0,01		

Table 3.11 shows the average plot size of farmers with own land, about 33% of all interviewed farmers (Table 3.7). The farmers in Cirebon had the largest plots, while the two farmers in Brebes with own land the smallest plots.

Table 3.11 The average size of owned land (m<sup>2</sup>) in Brebes, Cirebon and Pekalongan.

Location	n	Average	Minimum	Maximum
Brebes	2	1,500	1,400	1,600
Cirebon	6	9,077	2,500	19,200
Pekalongan	7	4,657	1,600	10,000

In Brebes, land (both owned by individuals and controlled by village head) was mostly used for growing sugarcane before rented out to farmers (Table 3.12). Usually every two-year agricultural land in Brebes is rented by the local sugar factory for one year to grow sugarcane. The transaction between sugar factory and land controllers was coordinated by the village head. Sugarcane and paddy rice were the most common preceding crops produced on rented land by farmers in Cirebon. On land previously used for sugarcane, farmers would usually grow shallot from July to September, while land used for paddy would be used for shallot from April to June. In Pekalongan, the rented land was mostly used for paddy or peanut.

Table 3.12 Land use of plots before renting in Brebes, Cirebon and Pekalongan.

Crop	Brebes (# of plots)	Cirebon (# of plots)	Pekalongan (# of plots)
fallow	0	1	0
peanut	0	0	5
rice	1	4	4
rice/sugarcane	0	0	2
shallot	0	2	0
sugarcane	14	7	0
sweet corn	0	2	2
yard long bean	0	0	2

In general, the land rent period in the three studied locations was 12 months (Table 3.13). Few land owners rented out their land for two years (24 months).

Table 3.13 Land rent period of plots in Brebes, Cirebon and Pekalongan.

Number of months	Brebes (# plots)	Cirebon (# plots)	Pekalongan (#plots)
3	0	1	0
10	1	0	0
12	12	12	7
18	0	1	0
24	2	2	4
36	0	0	1
48	0	0	1
60	0	0	1
180	0	0	1

Most tenant farmers in Brebes started to rent land in July/August after the sugarcane harvest (Table 3.14). In Cirebon, most farmers started to rent land in June-August, but few farmers also started to rent in October-November. Most farmers in Pekalongan started to rent land in December-January. Most likely they started using the rented plot with growing rice in the wet season.

Figure 3.1 shows the cropping pattern of rented land in the three study locations. The cropping pattern in Cirebon and Brebes is more or less the same with shallots produced all year round. Some farmers produced shallots after rice and/or rotated shallots with sweet corn. In Brebes, however, more farmers included hot peppers in their cropping pattern either as rotation crop for shallot or intercropped with shallot. In Pekalongan less shallot is produced and vegetable production is more varied, for example, with cucumber and yard long bean plots. The cropping pattern of own land shows the same pattern as on rented land (Fig. 3.2).

Table 3.14 The start of land renting period in Brebes, Cirebon and Pekalongan.

Month	Brebes (# plots)	Cirebon (# plots)	Pekalongan (# plots)	Total
January	0	0	5	5
February	0	0	0	0
March	0	0	0	0
April	1	0	0	1
May	0	1	0	1
June	1	2	0	3
July	10	4	0	14
August	3	4	2	9
September	0	0	1	1
October	0	1	0	1
November	0	4	0	4
December	0	0	7	7

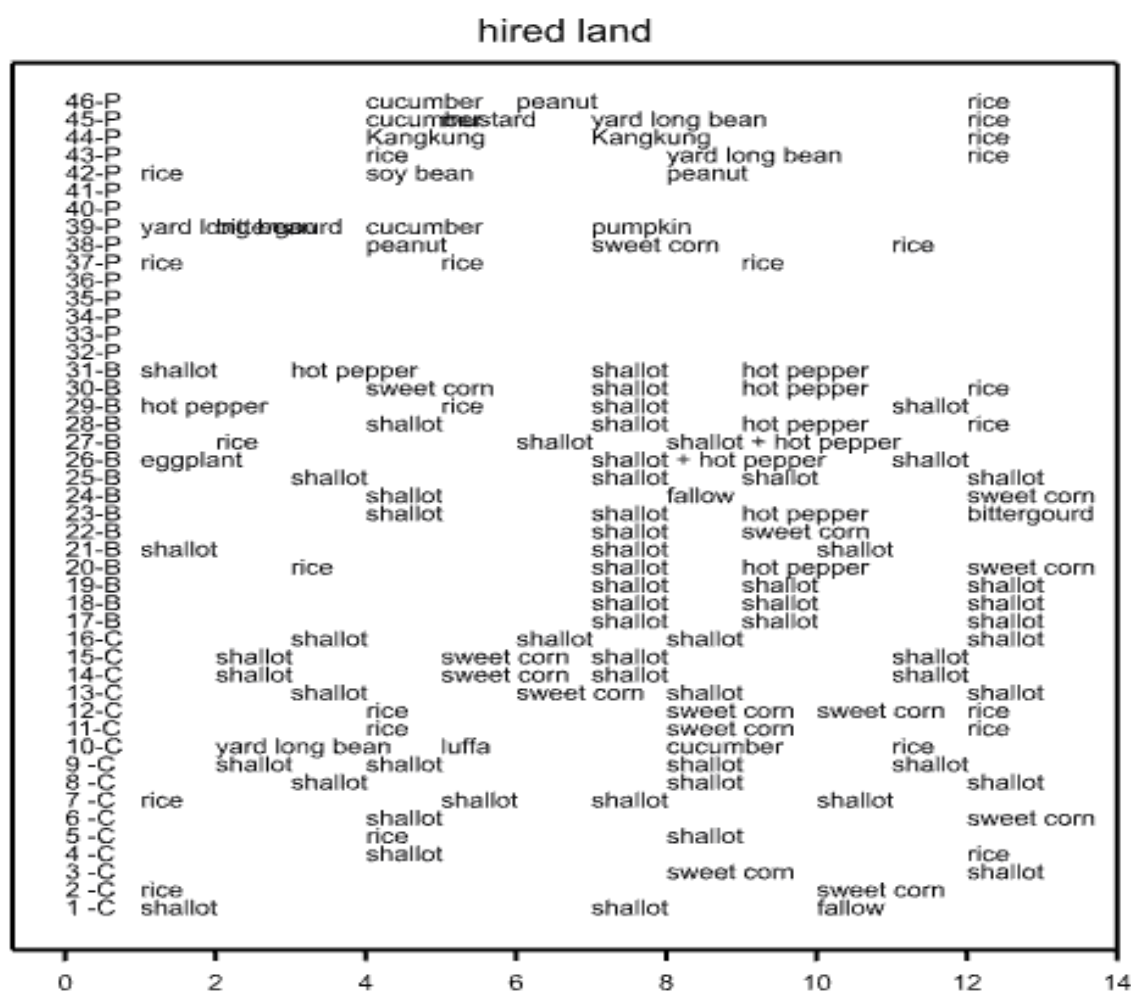


Figure 3.1 Cropping pattern on rented land in Cirebon (C), Brebes (B) and Pekalongan (P) during 14 months (X-axis: month 1 = January; Y-axis: farm identification numbers).

own land

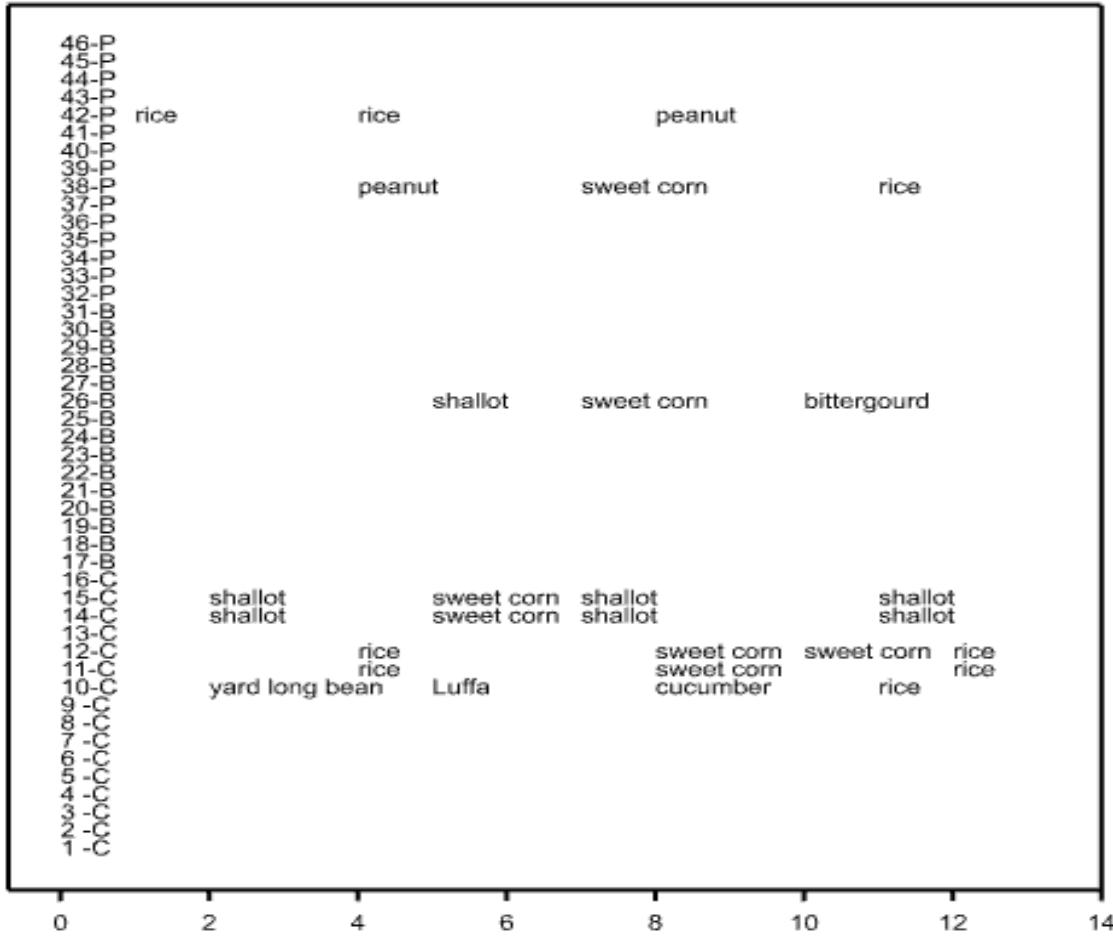


Figure 3.2 Cropping pattern of own land in Cirebon (C), Brebes (B) and Pekalongan (P) during 14 months (X-axis: Month 1 = January; Y-axis: farm identification numbers).

The most frequently produced crops in Brebes were shallot, hot pepper, rice and sweet corn. In Cirebon, the most frequently produced crops were shallot, followed by sweet corn, rice and cucumber/yard long bean. In Pekalongan the most frequently produced crops were rice, followed by peanut, sweetcorn, mung bean, cucumber, yard long bean and soybean. In contrast with the other two regions no shallot was produced in Pekalongan.

Table 3.15 Number of crops produced by farmers in Brebes, Cirebon and Pekalongan, 2015.

Crop	Brebes (#crops)	Cirebon (#crops)	Pekalongan (#crops)	Total
Bittergourd	2	0	1	3
Cucumber	0	2	4	6
Eggplant	1	0	0	1
Fallow	1	1	1	3
Hot pepper	7	0	0	7
Kangkong	0	0	2	2
Squash	0	1	0	1
Mangogo	0	0	1	1
Mustard	0	0	1	1
Peanut	0	0	15	15
Munkbean	0	0	5	5
Pumpkin	0	0	1	1
Rice	5	14	27	46
Rice / sugarcane	0	0	2	2
Shallot	31	35	0	66
Shallot + Hot pepper	2	0	0	2
Soybean	0	0	3	3
Sugarcane	1	0	0	1
Sweetcorn	5	16	8	29
Cucumber "suri"	0	0	1	1
Yard long bean	0	2	4	6

Some farmers produce rice for self-sufficiency reasons even though it is often less profitable than producing vegetables. Other farmers produce rice out of a tradition that is hard to abandon. But other farmers, especially in Pekalongan, indicated that due to the local conditions where fields are easily flooded, the wet season is only suitable for rice production and less suitable for non-rice or vegetable crops.



Table 3.16 Reasons for producing rice on rented land in Brebes, Cirebon and Pekalongan.

Reason	Brebes (# farmers)	Cirebon (# farmers)	Pekalongan (# farmers)	Total <sup>1)</sup>
Family self-sufficiency in rice	9	6	10	25
More profitable than growing vegetables	0	1	0	1
Tradition	1	5	8	14
The season is too wet for growing non-rice crops	2	1	7	10
It requires less labor	2	1	3	6
Others (less capital-intensive, water availability)	0	1	1	2

<sup>1)</sup> The interviewed farmers could mark more than one reason.

Table 3.17 shows reasons of farmers who still continue to grow rice even though they were fully aware that growing vegetables may also provide cash income to buy rice. The three most important reasons were (1) rice was a low risk crop (guaranteed minimum price) as compared to vegetables that still provided some basic income even when vegetables failed, (2) farmers do not want to take a risk for not being able to buy rice, and (3) rice needs less care as compared to vegetables (less labour demanding).

Table 3.17 Reasons for continuation of rice production by farmers in Brebes, Cirebon and Pekalongan.

Reason	Brebes	Cirebon	Pekalongan	Total <sup>1)</sup>
There is a minimum price for rice set by the government	1	4	4	9
Farmer is risk-averse	4	3	5	12
Rice is a low risk crop (as compared to vegetables) that still gives some basic income even when production of vegetables fail	7	3	4	14
Rice needs less crop care as compared to vegetables	2	5	5	12
Price volatility of rice is lower than vegetables	1	0	0	1
Rice is easier to store and sell when farmer needs immediate cash money	2	2	6	10
The (rainy) season is too wet for growing other crops	2	2	7	11
Investment for growing rice is much lower than vegetables	2	4	2	8
Others (rainfed field, simultaneous cropping pattern, land conditions mostly suitable for rice)	2	0	1	3

1) The interviewed farmers could mark more than one reason.

## 3.2 Land owners

In the three study areas five land owners were interviewed. In Pekalongan, these land owners owned on average 2.4 plots, while in Brebes and Cirebon they owned about three plots. The land owners of Cirebon were the largest with on average 2 hectare of land, three times more than in Brebes and eight times more than in Pekalongan. The number of plots rented out was highest in Brebes, but the total land area rented out was a bit larger in Cirebon. The average renting period was 12 months in Brebes and Cirebon and 17.6 months in Pekalongan.

*Table 3.19 Some characteristics of the interviewed land owners in Brebes, Cirebon and Pekalongan.*

		Brebes (n=5)	Cirebon (n=5)	Pekalongan (n=5)
Number of owned parcels	Min	2	2	1
	Max	6	5	4
	Mean	3.2	3	2.4
Total land size (m <sup>2</sup> )	Min	4,500	4,900	1,400
	Max	10,000	35,000	4,200
	Mean	7,380	20,020	2,420
Number of plots rented out	Min	2	1	1
	Max	4	2	1
	Mean	2.6	1.4	1
Total size of land rented out (m <sup>2</sup> )	Min	3,200	2,100	350
	Max	6,400	15,000	1,600
	Mean	5,060	5,820	1,330
Renting period (month)	Min	12	12	4
	Max	12	12	36
	Mean	12	12	17.6

None of land owners in Brebes and Cirebon was willing to rent out land for longer periods (e.g. 3-5 years). In contrast, four out five land owners in Pekalongan were willing to rent out their land for longer periods. This might be related to the crop that would be produced on the rented land. The more commercial the crop (e.g. shallot), the less willing land owners are to rent out their lands for 3-5 years. The main reason was that the rent price tends to increase in time. Hence, land could be rented out to higher prices in the following years. Especially in Cirebon land owners also considered that the soil fertility of the land may decline when it is used continuously for vegetables.

Renting land to sugar cane factories is a common practice in the all three locations. To some owners these factories are preferred renters because they tend to rent large blocks of land at one time. The factory manages then the fields.

Table 3.20 Reasons for renting out land by land owners in Brebes, Cirebon and Pekalongan for longer periods (e.g. 3-5 years).

Willingness to rent out the land for a longer period (e.g. 3-5 years):	Brebes (n=5)	Cirebon (n=5)	Pekalongan (n=5)	total
no	5	5	1	11
yes	0	0	4	4
<b>Reasons for not renting out the land for longer periods<sup>1)</sup>:</b>				
There is a potential of obtaining less rental revenues when rented out for longer period	1	-	-	1
Potential decline of soil fertility when the land is used continuously for vegetables by tenants	1	5	-	6
Tenants are not reliable or lack of credibility	-	-	-	-
There is a possibility that farmers will use the lands for non-agricultural activities	1	1	-	2
Rent price tends to increase over the years, hence it will be more profitable to rent the land per year	2	4	2	8
Others (for own purposes, no demand, currently used by sugarcane factory)	3	3	-	6

<sup>1)</sup> The interviewed land owners could mark more than one reason.

The most commonly used method for paying the land rent is cash (paid at the start of renting period), especially in Cirebon and Pekalongan. Some land owners in Brebes allowed tenant farmers to pay by instalments, for example, every six months or pay the rent after harvest.

Table 3.21 Land rent payment methods in Brebes, Cirebon and Pekalongan.

Payment	Brebes (n=5)	Cirebon (n=5)	Pekalongan (n=5)	Remarks
All at once at the start of renting period	2	5	4	-
Installments	3	0	1	<ul style="list-style-type: none"> <li>• Every six months</li> <li>• After harvest</li> </ul>

For all the three study locations, the most important factors that affected the land rent price was the previously grown crop, water availability, accessibility, and land/soil fertility (Table 3.22). However, for Pekalongan the most important factor was soil fertility, while water availability was considered less important.

*Table 3.22 Factors affecting the price of rented land, and their importance according land owners in Brebes, Cirebon and Pekalongan.*

<b>Reason</b>	<b>Brebes</b>	<b>Cirebon</b>	<b>Pekalongan</b>	<b>Total</b>
Previously grown crop (for example, land previously used for sugarcane is more expensive than previously used for rice)	5	5	-	10
Soil fertility	1	1	3	5
Water availability	3	5	1	9
Accessibility	1	3	2	6
Land rental market price	-	-	1	1

### **3.3 Village heads**

Village heads also manage public land that can be rented out to individual farmers. The average number of publicly owned plots by the five village heads was lowest in Brebes (1.7), while in Pekalongan and Cirebon it was about the same (Table 3.23). On average, the total public land area in Brebes and Cirebon was about the same, three hectare, which was approximately three times more than in Pekalongan. The number of plots rented out was highest in Cirebon (2.3), but the land size rented out was largest in Brebes. The average renting period was 12 months in Brebes and Cirebon and 28 months in Pekalongan.

*Table 3.23 Some characteristics of public land, owned by village heads in Brebes, Cirebon and Pekalongan that is rented out.*

Indicator		Brebes (n=3)	Cirebon (n=3)	Pekalongan (n=3)
Number of publicly owned plots	Min	1	2	1
	Max	2	4	5
	Mean	1.7	2.7	2.3
Total land size (m <sup>2</sup> )	Min	20,000	20,000	2,800
	Max	31,600	30,000	15,000
	Mean	23,867	25,000	7,100
Number of plots rented out	Min	1	1	1
	Max	2	4	2
	Mean	1.3	2.3	1.3
Total land rented out (m <sup>2</sup> )	Min	18,000	10,000	2,800
	Max	30,000	30,000	3,500
	Mean	22,667	21,667	3,167
Renting period	Min	12	12	24
	Max	12	12	36
	Mean	12	12	28

None of village heads in Brebes and Cirebon was willing to rent out the land for longer period (e.g. 3-5 years). In contrast, two out of three village heads in Pekalongan were willing to rent out the land for a longer period. The main reason for not renting out for longer periods was the annual increase in land rent prices. Village heads also considered that the soil fertility of the land may decline when it is used continuously for vegetables.

Table 3.24 *Reasons to rent out public land owned by village heads for longer periods.*

<b>Willing to rent out public land for longer periods (e.g. 3-5 years):</b>	<b>Brebes</b>	<b>Cirebon</b>	<b>Pekalongan</b>	
no	3	3	1	
yes	0	0	2	
<b>Reasons for not renting out public land for longer periods:</b>				
The possibility that rental revenues are lower when land is rented out for longer period	2	1	-	3
Potential decline of soil fertility when the land is continuously used for vegetable production by tenants	2	3	-	5
Tenants are not reliable or lack solvency	-	-	-	-
Possible use of land for non-agricultural activities by village	-	-	-	-
Rent price tends to increase annually	3	4	-	5
Others (for own purposes)	-	-	1	1

All village heads, especially in Cirebon and Pekalongan, preferred to receive cash paid at the start of the renting period (Table 3.25). One village head in Brebes allowed tenants to pay by two instalments, i.e. every six months.

Table 3.25 *Land rent payment methods preferred by village heads in Brebes, Cirebon and Pekalongan.*

<b>Payment method</b>	<b>Brebes (n=3)</b>	<b>Cirebon (n=3)</b>	<b>Pekalongan (n=3)</b>	<b>Remarks</b>
Cash paid at the start of renting period	2	3	3	-
Installments	1	0	0	every six months

For all the three study locations, the most important factor that affected the rent price was water availability, the previously produced crop, accessibility, and land size. For Pekalongan, the most important factor was accessibility, followed by water availability and land size that were considered equally important in Pekalongan.

*Table 3.26 Factors affecting the rent price of publicly land owned by village heads in Brebes, Cirebon and Pekalongan.*

<b>Reason</b>	<b>Brebes</b>	<b>Cirebon</b>	<b>Pekalongan</b>	<b>Total</b>
Crop previously produced (e.g. land previously used for sugarcane is more expensive than previously used for	3	3	-	6
Land size	-	-	1	1
Water availability	3	3	1	7
Accessibility	1	1	2	4
Land rental market price	-	-	-	-

## 4. Discussion and conclusions

In general, the period of land rent was mostly one year (12 months). Very few tenants had the possibility of renting land for two years (24 months) or more. About half of the interviewed tenants was interested to rent land for a longer period (2 – 5 years). Reasons for not being interested to rent land for more than a year related to the unwillingness of land owners, farmer tenants' uncertainty of sufficient working capital, and the risk that soil fertility would decline over a longer rent period.

The average rented land size and total rented land area was largest in Cirebon and smallest in Brebes. The land price was highest in Brebes and lowest in Pekalongan. Most likely land scarcity in Brebes drives the land prices to higher levels than in the other two study areas. The price of rented land was mostly determined by water availability and the previously grown crop, for example, land previously used for sugarcane is more expensive than land used for rice.

Factors considered by land tenants to rent plots of land were water availability, soil fertility, and the price. In Brebes, farmers normally rented one plot, while in Cirebon and Pekalongan about 35-40% of the farmers rented more than one plot. Only one third of the farmer tenants also owned a plot of land, 20% of the farmers owned one plot and 13% owned more than one plot. The average size of owned land was the largest in Cirebon (9,000 m<sup>2</sup>) and smallest in Brebes (1,500 m<sup>2</sup>). Subleasing of land also happens because of immediate cash needs of the tenant or the tenant is a land rent broker who earns money by subleasing land to other farmers.

In Brebes and Cirebon, most rented land was previously used for sugarcane or paddy, while in Pekalongan most land was used for peanut or paddy. In Brebes and Cirebon, farmers usually started the rent period in June-August at the time of the sugarcane harvest. In Pekalongan, tenant farmers use much of the rented land for rice production and they started to rent most of the land in December-January at the start of rainy season. Most preferred rent payment was cash (paid at the start of renting period), but few renters were allowed to use instalment or delayed system (every six months or once after harvest).

Some of the tenant farmers grow rice on rented land even though the production of vegetables is potentially more profitable. The main motivation of farmers to produce rice is to become self-sufficient in rice for household consumption. Other farmers suggested that rice is produced out of a tradition, a less risky crop than vegetables, and because the wet season is too wet for producing non-rice or vegetable crops.

Both individual and village land owners in Cirebon and Brebes were not interested to rent out land for a longer period (3-5 years) because (a) renting out a plot each year is more profitable as rental prices tend to increase over time, and (b) of the perceived risk of decreasing soil quality/fertility when a plot is continuously used for vegetable production.

The findings of this explorative study show the difficulty to improve the vegetable sector in the lowlands of Java by introducing permanent vegetable cropping systems. In the first place the general willingness to rent and to rent out land is low due to fact that both land tenants and land owners, respectively, are not in favour of long term contracts. The reasons are partly interrelated and partly different: Land owners want to benefit from the annually increasing rent prices and are afraid of deteriorating soil quality/fertility with longer rent periods. About 50% of the farmers say that they are willing to rent land for periods longer than one year but are not allowed to do so because of the land owners. In addition, the availability of sufficient working capital is a constraint for farmers to rent for longer periods. This relates to the involved risks of renting land for long periods and the associated loss in flexibility to change current livelihood strategy. Another reason is that, especially in Pekalongan, rice is still considered an important crop to include in the farming system for rice self-sufficiency purposes.



Interestingly, in this location four of the five land owners was interested to rent out land for a period of 2 to 5 years.

This study, though limited in scope, showed that there are clear differences between land owners and farmers in their interest to rent and rent out land for longer periods, which is an important boundary condition for introducing permanent vegetable systems. The study also showed that there are differences among regions, for example, land owners in Pekalongan were more interested to rent out land for longer periods than in Brebes or Cirebon. The observed differences provide scope for introducing permanent vegetable systems, but more in-depth studies with a larger scope are needed to identify regions where conditions are most favourable for introducing such systems.

## 5. Reference

- FAO. 1995. Planning for Sustainable Use of Land Resources: Towards a New Approach. Land and Water Bulletin 2. Rome.
- Hubacek, K. and J.C.J.M. van den Bergh. 2002. The Role of Land in Economic Theory. IIASA Interim Report . IIASA, Laxenburg, Austria.
- Jayne, T.S., J. Chamberlin and D.D. Headey. 2014. Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. Food Policy 48: 1–17.
- Metzemakers, P. and E. Louw. 2005. Land as a production factor. Paper to be presented at 45th Congress of the European Regional Science Association in Amsterdam, 23-27 August 2005.
- Place, F. and A. Meybeck. 2013. Food security and sustainable resource use – what are the resource challenges to food security? Background paper for the conference “Food Security Futures: Research Priorities for the 21st Century”, 11-12 April 2013, Dublin, Ireland.

## 6. Annex I. Survey Protocol and Questionnaire

### Survey on socio-cultural and economic-institutional aspects in the lowlands of Indonesia affecting adoption of permanent vegetable systems.

#### Protocol:

Background: vegIMPACT has tested permanent vegetable systems in practice to demonstrate the technical and economic feasibility of such systems. Large-scale introduction of such systems will need, however, better understanding of a number of socio-cultural and economic-institutional aspects that affect farmer adoption. Therefore, a farm survey in the Cirebon – Pekalongan area is proposed to gain more insights in how such factors may affect adoption.

#### Set-up survey

- Work as much as possible with multiple choice questions, those work most easily and facilitate quick analysis of data.
- Set-up (e.g. number of interviews, where) also depends on how we want to analyse and use the collected data, i.e. use in a descriptive form, contextual, or identify statistical differences among different farmer types or locations?
- The interview itself should not take more than 30 minutes per farmer. Farm visits not together as a group.

#### Who, what, when, where?

Only farmers who grow vegetables are included in the interview. These farmers may also grow other crops.

Per region 15 farmers will be interviewed.

Cirebon: 10 pilot farmers (records) + 5 additional non pilot farmers

Brebes: 15 farmers

Pekalongan: 15 farmers

Per region:

Maximum 5 landowners (total 15)

Maximum 3 village/desa heads (total 9)

Additional: Local experts (e.g. Dinas): To cross check farmers responses, some experts could be interviewed too. No priority yet. Secondly they can be interviewed to have more info on land rent systems and background issues.

The survey should be carried out early 2016 in order to have ample time to analyse and report

Per target group a separate survey form should be developed

#### Questionnaire:

#### Farmers/Renters

##### 1. General information on the interviewed farmer

1.1 Name

1.2 Desa/Kecamatan/Kabupaten

1.3 Phone no.

1.4 Age

1.5 Off farm income = .....% of total income (estimated)

## 1.6 Household composition

- a. Number of male persons > 16 years = .....persons
- b. Number of male persons > 16 years working on farm = .....persons
- c. Off farm work: .....total nr of days per week (average over the year)
- d. Number of female persons > 16 years = .....persons
- e. Number of male persons > 16 years working on farm = .....persons
- f. Off farm work: .....total nr of days per week (average over the year)
- g. Number of male persons <= 16 years = .....persons
- h. Number of female persons <= 16 years = .....persons

## 2. Land use

## 2.1 Do you rent land? YES/NO

In case of NO please continue with question 3.2

In case of YES please continue with question 2.2

## 2.2 From whom do you rent land? Village, private owner, government, etc?

- a. Village
- b. Private owner
- c. Other farmers who rent their rented lands
- d. Others.....

## 2.3 May we have contact details of the land owner? .....

## 2.4 Why do you rent land?

- a. has no land at all and with this it is possible to generate income from farming
- b. has not sufficient own land to satisfy food/income needs
- c. has labour surplus next to off-farm work and wants to make more money.

## 2.5 For how many months is rent/lease contract for?.....months

Or other arrangement (please describe terms of conditions when a rent starts and when it ends).....

## 2.6 What is the renting fee for the period stated in 2.5 per standard unit?

.....IDR per .....local unit .....m2

## 2.7 What things that would make you deciding to rent a particular parcel of land?

- a. Easy access
- b. Water availability
- c. Soil fertility
- d. Land size appropriateness
- e. Affordability
- f. Renting period allowed
- g. No choice
- h. Others..... (*multiple answers possible*)

## 2.8 Would you like to rent fields for a longer period? E.g. more than 5 years? YES/NO

## 2.9 In case of NO why is this?

- a. Is not possible due to the land owner, he doesn't like to rent out land for longer periods.
- b. Uncertain if I can afford to pay every year the rent, with short term rents I can decide every season how much I can rent based in the available money.
- c. Providing more flexibility when deciding to take a temporary off
- d. Degradation of land quality

- e. Better deal with other land owner
- f. More convenient location or better quality plot (e.g. plot-farm distance, land quality)
- g. other reasons:..... (*multiple answers possible*)

2.10 During your farming experience, have you ever rented a piece of land more than 1 year? YES/NO

2.11 In case of YES, please explain when and why!

### 3. Renting in and renting out

3.1 How many fields have you rented in 2015? .....(number)

3.2 How many owned fields had you in 2015?.....(number)

In case of owned land:

3.3 Did you yourself rented out land in 2015? YES/NO

3.4 In case of YES what was the reason the rent out land.

- a. no resources (labour, capital) available to plant all the land,
- b. rents out his poorest land and keeps the best for own farming
- c. needs cash from renting out land
- d. custom/tradition/ farmer does not want to disappoint neighbouring farmers who have little land
- e. Other:.....[*multiple answers possible*]

3.5 Have you ever rented a “rented” land? YES/NO

3.6 In case of YES, please thoroughly explain when, why, how!

3.7 Why are you rented out a “rented land”? Explain!

3.8 Cropping pattern and field use

Please fill in the table. Per separate field used in 2015 fill in the acreage in m<sup>2</sup>, and the crops grown with the months that it was grown.

Ownership	field	acreage (m2)	Previous crop before renting	Crop 1	Crop 2	Crop 3	Crop 4
Rented	1		crop name				
		2	Period in the crop name				
		3	Period in the crop name				
		4	Period in the crop name				
Owned	1		crop name				
		2	Period in the crop name				
		3	Period in the crop name				
		4	Period in the crop name				

#### 4. Rice in cropping pattern

In case rice is grown by the farmer the next questions can be asked

##### 4.1 Why do you grow rice?

- a) food self-sufficiency,
- b) more profitable,
- c) custom/do not know,
- d) season too wet to growth other crop,
- e) less labour demand,
- f) other.....

*(more answers are possible)*

**4.2 Imagine that with only vegetable crops enough cash can be earned to buy rice instead of growing itself. Would you still want to grow your own rice? YES/NO**

**4.3 In case of YES what are the main reasons to grow it yourself.**

- a) Government minimum support price
- b) I don't want to take the risk not be able to buy rice
- c) Rice is a crop with low risks (while vegetables are high-risk) and give some basic income even when vegetables fails
- d) Rice requires less care and effort to grow than vegetables
- e) A much lower degree of price volatility than vegetables
- f) More easily to be stored and then sold when the need of cash arises
- g) Because the wet season is too wet to grow another crop,
- h) For rice investment costs are low while vegetables needs a lot
- i) Do not know
- j) Other:..... (multiple answers possible)

### Land owners

#### General data

1. Name:
2. Address:
3. Total land ownership:
4. Acreage of rented out land to farmers:
5. Usual term of rent period: .....months. Or other arrangement:.....
6. Opinion on longer renting period (e.g. 5 years) for vegetable crops, would it be possible? YES/NO
7. If NO, why not?
  - a. I am not renting out land for longer period because it is risky as I may lose it,
  - b. Land quality degrades due to longer use by one farmer for vegetables
  - c. Unreliable land tenants,
  - d. I want to use the land when I need it for other purposes,
  - e. The rent price tends to increase every year – more profitable to rent the land yearly
  - f. Other:.....
8. Would you consider instalment as the payment method? YES/NO
9. If yes, what would be the usual instalment period? Every.....months?
10. Would you consider a discount when land can be rented out for longer period? YES/NO
11. If Yes, how much would you consider?
  - a. 0.5 – 1 %
  - b. 1 – 5 %
  - c. 5 – 10%
  - d. 10% ->
12. Is the rent price based on:

- a. Previous crop (eg rice as pre crop is cheaper than sugar cane)
- b. Field size
- c. Water availability
- d. Intended use by the farmers who rents it
- e. Other:.....

13. Any preference to whom you decide to rent out your land? YES/NO. Explain!

### **Village Heads**

1. Name of the village/desa:
2. Address:
3. Total land ownership:
4. Acreage of rented out to farmers:
5. Usual term of rent period: .....months. Or other arrangement:.....
6. Opinion on longer renting period (e.g. 5 years) for vegetable crops, would it be possible?  
YES/NO
7. If NO, why not?
  - a. The desa is not renting out land for longer period because it is quite risky as the desa may lose it,
  - b. Land quality degrades due to longer use by one farmer for vegetables
  - c. Unreliable land tenants,
  - d. I want to use the land when I need it for other purposes,
  - e. The rent price tends to increase every year – more profitable to rent the land yearly
  - f. Other:.....
8. Would you consider instalment as the payment method? YES/NO
9. If yes, what would be the usual instalment period? Every.....months?
10. Would you consider a discount when land can be rented out for longer period? YES/NO
11. If Yes, how much would you consider?
  - a. 0.5 – 1 %
  - b. 1 – 5 %
  - c. 5 – 10%
  - d. 10% ->
12. Is the rent price based on:
  - a. Previous crop (eg rice as pre crop is cheaper than sugar cane)
  - b. Field size
  - c. Water availability
  - d. Intended use by the farmers who rents it
  - e. Other:.....
13. Any preference to whom you decide to rent out your land? YES/NO. Explain!



14. How is the mechanism or what is the procedure when sugar factory wants to rent a land? Explain!