

Wooden furniture industry of Indonesia: facts and figures from Jepara

Jean-Marc Roda, Philippe Cadène, Philippe Guizol, Levania Santoso, Achmad Uzer
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1 Introduction

Jepara is a particular case in Java with its ancient carving industry which made its fame all along the years and worldwide. This fame helped Jepara to attract number or economic activities linked to the wood products industries, and Jepara is now especially known for hosting a dynamic sector of wood furniture production.

Today Jepara has become a typical example of what scholars call an “industrial districts”, concentrating a burgeoning activity in one particular sector (furniture industry), with thousands¹ of very small to medium sized industries concentrated in the “Kabupaten”, or administrative district. This high concentration entails the concentration of other derived activities, which made the location very attractive for a wood products activity. As the

¹ 3597 enterprises, according to the administrative district statistics (Pemerintah Kabupaten Jepara, 2004), but there is a lot of “unregistered” enterprises, and the administrative district expects that the real number could be as much as 5000... Our survey has demonstrated that the reality is far beyond that.

number of showrooms demonstrates it, any businessmen can embrace in one look at Jepara almost all what Java can offer in terms of different type of furniture industries, know-how, traders, transport industries, designs, and so on.

This local concentration of industrial activities also led to a formidable economic boom of Jepara and its surroundings. As an example, the necessity of containers trucks access for the furniture exports led the former Bupati to obtain the classification of some major roads of the district as “provincial class” roads, which fact reciprocally allowed container trucks to reach most parts of the districts, thus promoting the growth of all economic activities. This retroaction effect gave to Jepara a new scale, attracting more activities, and more people. Another example of this virtuous dynamic is the minimum standard wage of the workers, which has the reputation of being significantly higher in Jepara than in the rest of the province.

The Jeparan industrial dynamic has also a strong influence on the Indonesian wood products chain; attracting the production of forests located all over Java (Fig1), and even located in the outer islands. Thousands of trucks and pickups bring logs day and night into the district, coming from all Java, and from state forests as much as from community forests and plantations. Jepara, as much connected to the foreign markets (USA, Europe, Japan, Hong Kong, Australia...) as to the huge domestic market, acts as a bridge linking local forests and local people to the globalised market.

With altogether urban and forestry management concerns, spatially concentrated industries and scattered plantations all over Java, the context of the study is structured through several scales. There are specific methodologies that allow coping with this kind of multi-scaled context. Here will be used the FPN² methodology, especially developed for tropical forest product networks at CIRAD.

In the present report, we essentially summarize the main fact and figures about the industry in Jepara, among all the other results and findings of this research. These fact and figures have a specific interest since they show dramatic differences with what is usually assumed by the authors, or what is announced by the Indonesian authorities about the wooden furniture industry in Indonesia.

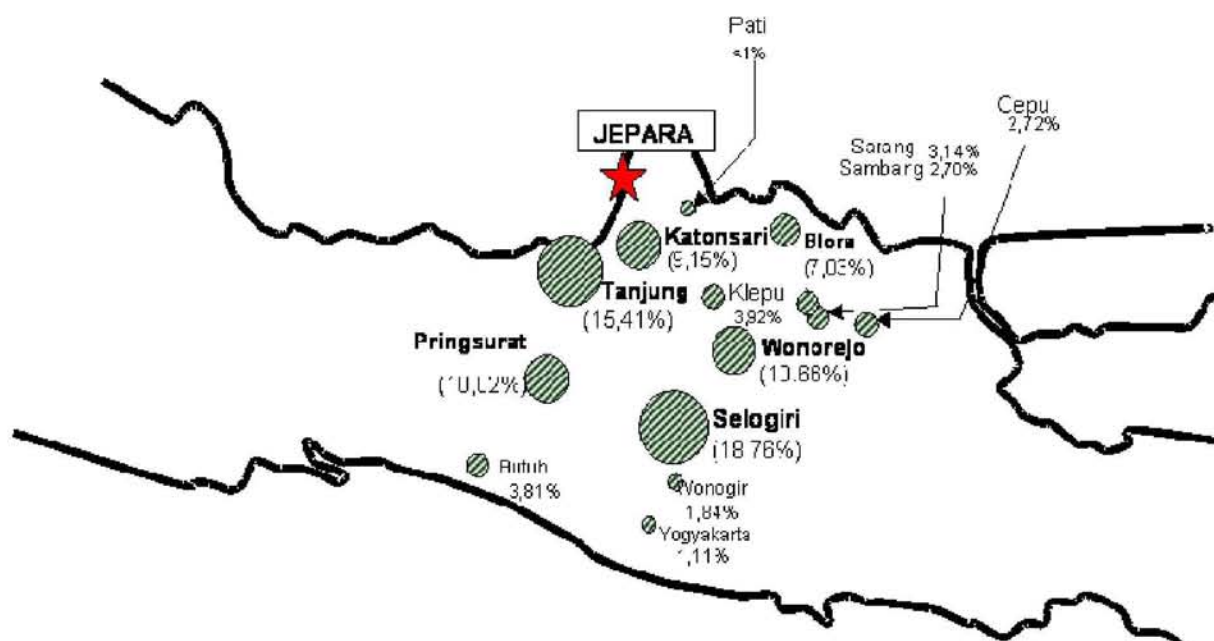


Figure 1 : Origin of teak supplies in Jepara, during June 2004 (Lazarovici & Schwartzemberg, 2004)

² Forest Products Networks analysis (Roda, 2004)

2 Material and Methods

2.1 Scientific context

The study of furniture and associated industries in Jepara aims to question the new forms of the economy in the context of globalisation. Systems of enterprises develop all around the world, which are based on networks of various localised activities and product distributions at various steps of the manufacturing and marketing processes. These systems also see a fierce competition between the entrepreneurs, independently of their localisation. Since the locations are now increasingly inter-connected on the global-scale, the enterprises' success becomes dependent of their relationships within the networks of actors, wherever they are localised. More precisely, the economic efficiency appears as a result of complex collaborations based on the proximity, either among the territories, or between the different steps of the manufacturing and the marketing process of the product.

The innovativeness of the proposed study is based on the combination of two interconnected / interrelated approaches. Considering the furniture industry of Jepara either as an industrial district, or like a network of enterprises which is set within a specific territory, the first approach aims to understand the furniture production processes, the flexibility of entrepreneurs of differentiated statuses. It also consists in analysing the economic and social relationships, which tie with suppliers, customers and intermediaries in various places, both in Indonesia and in other countries of the world. What is in stake here is to answer the questions concerning the bonds between the resource production system³, and the furniture industrial district of Jepara, where hundreds of thousands of jobs are concerned, as well as the marketing of the end products in the supermarkets or such retailing shops of the large urbanized regions of Asia, Europe or North America, where the population activity and prosperity is concentrated today. The recent evolutions of teak production patterns are a specific question, pushing the interest in the validity of new models of plantation in Java, which could offer a share of the initiative and incomes to the small private producers and the villagers. The future of the Jepara industrial district development is another question which focuses the interest on the improvement of the techniques, the standardization of the manufacturing processes, and the products quality control.

These elements altogether result in a web of the social relations established between the various actor, implying an evolution of the various statuses, often hierarchical, which link them among themselves, as well as an evolution of the relationship between producers within the manufacturing process.

Within this web, the various places that the actors occupy within the social system are decisive. In this regard, the bonds which they maintain within complex and extended family structures or which they establish with the various local authorities are often extremely significant.

The second approach quantifies the actors and flows, in order to understand the previously discussed elements. But it also contains an important scientific interest within itself. It is the necessary development of specific methodology which allows generating the statistical data needed to precisely measure the studied processes.

³ Essentially the teak wood, either harvested in the State plantations, or recently from the village plantations.

Regarding the globalisation, the analysis of the economic and social processes which drives the various actors existing within an industrial district on the one hand and those who take part in other places or countries in this dynamics on the other hand are recently the subject of thorough studies. The various scales taken into consideration by the same study are only in gestation in social sciences so far. On the other hand, the quantification of flows set up by these actors who circulate within the networks remains a hardly explored field of research. Addressing this stake needs the combined exploitation of precise questionnaires on the one hand while on the other hand technical analyses of the production processes must be taken into account with precision. It also needs spatial analysis using adequate software which allows differentiating the relative weights from the various categories of indexed flows.

The scientific ambition of our present research lies in the combination of a systemic analysis of actors dynamics with a quantitative analysis of flows implemented by them. This ambition also lies in the link between social and environmental sciences, in the context of a research project which wishes to lead a change in observed practices via the dialogue between actors and thus contributing to sustainable development of the local economy. It is a multidisciplinary approach combining natural, social and engineering sciences.

2.2 Fieldwork methodology

2.2.1 Implementation of the work

The method consisted into implementing an extensive survey of Jepara, followed by a sampled intensive survey, the construction of an important database on the industry of Jepara, and the subsequent analysis. The fieldwork was conducted by a team of 12 **students**⁴, equipped with motorbikes, GPS devices, questionnaires, and computers. They were led by a survey coordinator and an administrative **coordinator**⁵. The main field work has been conducted from June 2005 to October of the same year, and the 5 steps of the field work were the following.

Step1 – extensive survey : simple typology and spatial distribution

The wood industry in the district of Jepara is not uniformly spatially distributed, but presents different concentrations which typology and granularity has to be qualified and quantified. The step began with a detailed localisation of all the industrial or commercial units which display, use, process or store some wood material. In the same time these units has been categorised according to a very simple typology (main activity, size of the unit, relatively to its main activity, leading to 18 categories of activity vs size of the unit).

Step2 - qualitative and quantitative survey (intensive survey)

The Jepara industry is a complex network of relationships and flexible subcontracting, so the first aim of this survey was to investigate how these relationships are structured, and how the production is organised, and linked in the same time to the different market segments, and to the different provenances of the wood material. Beside this qualifying work, a strong emphasis was put on the quantification, especially in order to understand how many a unit of raw material contributes to the employments, education, and social wealth of the system. According to the results of the step 1, a statistical sampling was calculated and spatialised, in order to conduce a survey where significance of the field data is balanced with the

⁴ Namely :

⁵ Namely :

impossibility to survey systematically all the small and medium enterprises of Jepara (3500 to 5000). The survey was conducted in one or several iterative steps, according to the availability of the surveyed people. The survey described the enterprises, their products, and their social interactions, relationships, competition, and cooperation.

Step 3 – investigation about the sources

Beside the fact that all the wood material is coming from outside the city, the Jepara society is deeply rooted into the rural Java, with strong social links between the entrepreneurs of the city and the farmers and producers of the multiple village plantations in Java. Understanding what are these links, and how are they structured, and how the social system of the producing villages is organised and benefit from the whole system, was the aim of this step.

Following the principles of the FPN methodology, the study was extended to the original places of the wood, in Java but outside the district of Jepara. Among the places of origin indicated by the survey in Jepara, the experts have chosen a set of sample representing the wider variety of cases. The corresponding villages and places were visited, and the survey was extended to these villages.

Step 4 – investigation at the low season

The production is seasonal, strongly influenced by the seasonality of the international market. Thus, a peak season extends from December to June, and a low season extends from July to November. The main survey (step 2) being held during the peak season, it was necessary to organise a statement survey, in order to qualify and assess the sensibility of the system.

Step 5 - investigation one year after the first survey

The production is highly evolutive, with some drastic changes from one year to the other, at least regarding a proportion of the timber furniture. A statement survey, one year after the first one, allowed to qualify and to assess the evolution of the system.

2.2.2 Articulation of the extensive survey with the intensive survey

The first extensive survey has been consisting in localising all the enterprises and workshops, including the smallest family ones, with GPS devices. The team, equipped with motorbikes, have been visiting all the smallest street and sideways. This showed a high level of spatial heterogeneity of the industrial location in Jepara. Thus, for the subsequent necessary sampling and detailed analysis of some enterprises, the field was divided into squares, each of them having to be independently surveyed. The theoretical optimal size of the squares was calculated using the standard interpolation method, with weighted distances. The general formulation of this method is the following:

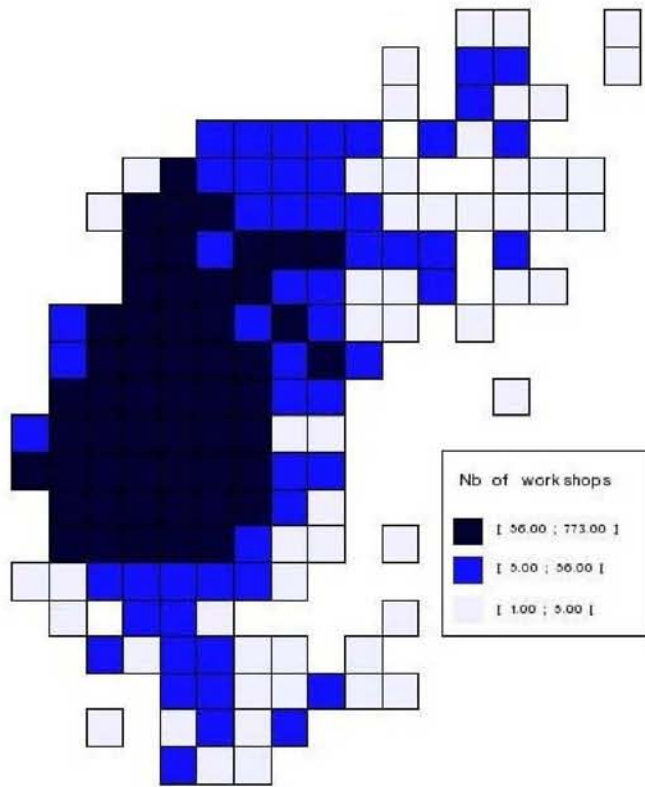


Figure 2 : General optimised grid, with the number of workshops in each square, according to 3 quantiles of 1/3 of the total number of enterprises each.

The spatial heterogeneity is so extreme that 80% of the workshops are regrouped into 17% of the squares : the remaining squares have a low density of workshops, and this is spread over a big territory. Thus, a finest grid has been surimposed for the center of Jepara. This do not necessarily means more work on the field, but that the level of spatial information can be finest. For the 33% of the most concentrated workshops, 1 optimized cell was transformed into 4 finest cell. For exemple, instead of doing a sample on 744 workshops in one cell, there is samples in 4 cells of 186 workshops. Ultimately, the sampling work is the same, and the same number of workshops is visited, but the detail of the spatial information in central jepara is better. The most concentrated workshops (as 33% of the total worksops quantity) lie in the darkest of the 3 zones. With the finest grid, the most concentrated square contains 389 workshops. The finest grid is illustrated in the figure 3.

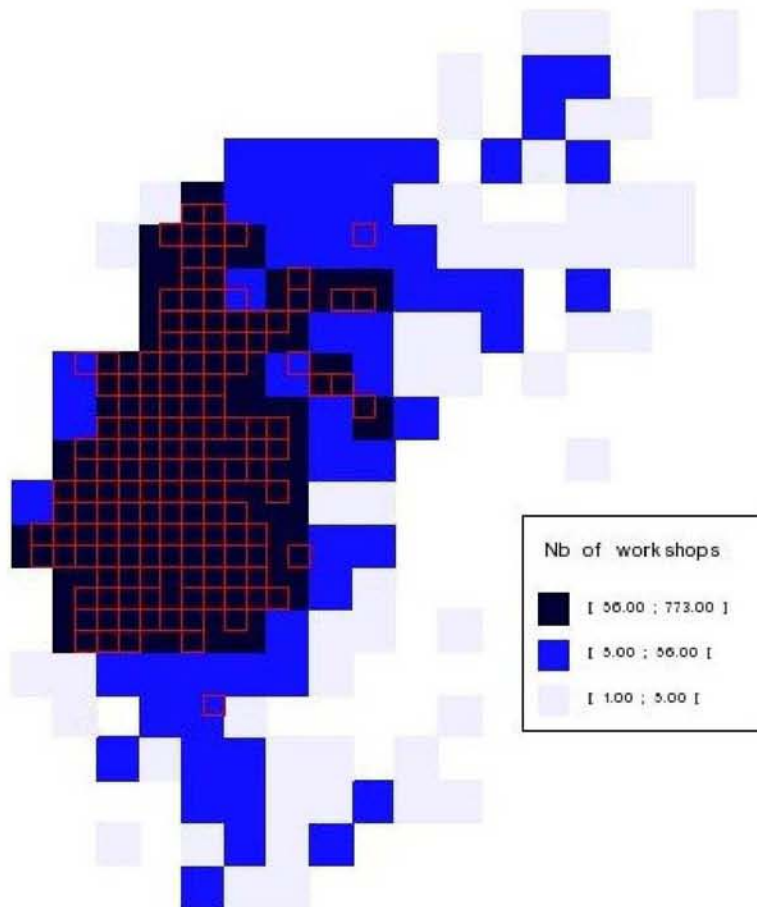


Figure 3 : Fine optimised grid.

2.2.3 Sampling and extrapolation methods

In order to insure a representative sampling with respect of the spatial heterogeneity, each square was independently sampled, according to a proportion of $1/n$. The n value was chosen according a pragmatical choice between the need for highest possible level of details, and the limit of available human and financial resource for the survey. Ultimately the n value was fixed as 0,06, that is to say a 6% sampling precision, which is very high and quite exceptional for this kind of socio-economic survey.

Regarding the superposition of the large grid and the finest grid, which are of different scales, it happens some large squares contain 4 smallest squares, but some contain only 1 to 3 smallest squares, which complicate the sampling and extrapolation method :

Denote $1/n$ as the proportion to be sampled, denote M as the number of workshops in the optimized square K , and denote m as the number of workshops in the fine square L :

- the number of workshop to be visited in square K is :

$$\frac{1}{n} \cdot M$$

- as well, the number of workshop to be visited in the fine square L is :

$$\frac{1}{n} \cdot m$$

Denote q as the number of fine squares L in square K . Denote q_{max} as the maximum of fine squares L within one square K . By definition q_{max} is 4 (4 fine squares L denoted as L_1, L_2, L_3, L_4).

- If $q = 4$ in square K , then the number of workshops to be visited in square K is the same than the number of workshops to be visited in squares L_1 to L_q

$$\frac{1}{n} \cdot M = \sum \left(\frac{1}{n} \cdot m_q \right)$$

- If $q < 4$ in square K , then the number of workshops to be visited in cell L is

$$\sum \left(\frac{1}{n} \cdot m_q \right)$$

and the number of workshops to be visited in the remaining part of cell K is

$$\frac{1}{n} \cdot \left(M - \sum \left(\frac{1}{n} \cdot m_q \right) \right)$$

The sample of workshops to be visited was computed for each category (activity vs size) of units localised by the first extensive survey. When the calculation was leading to a fractioned number of unit to be sampled, this number was rounded to the upper whole number. This ended in the fact that in each square, the actual proportion of sampling was $1/n'$, slightly different from the theoretical proportion of $1/n$:

$$\frac{1}{n'} \neq \frac{1}{n}$$

For the extrapolation of the results from the sample to all Jepara, and for each category (activity vs size) of units, it is the actual proportion $1/n'$ of the effectively sampled units vs the total number of units in each square K of the grid, which is computed, leading to extrapolated squares.

Denote C as one category of units (activity vs size), within the 18 categories which were found in the city.

Denote F_{CK} as a quantity measured through the sampling method for the category C , within a square K , according to the actual sampling rate of $1/n'$.

Denote E_{CK} as the quantity extrapolated from the quantity F for the category C , within a square K .

- E_{CK} is : $E_{CK} = F_{CK} / \frac{1}{n'}$

- Then the total extrapolated quantity E_C for Jepara (for the category C) is

$$E_C = \sum F_{CK} / \frac{1}{n'}$$

- And for Jepara, the extrapolated total quantity for one activity (totalising the units of different size categories) is : $E = \sum_C \sum_K F_{CK} / \frac{1}{n'}$

3 Results

3.1 *The real importance of the wood industry in Jepara, as demonstrated by the extensive survey*

15 271 units (enterprises) have been identified, localised, analysed (Figure 4). This quantification is very near to an exhaustive census of all the existing units, but is not, since we have evidences that a small part of the workshops and enterprises have not been seen by the surveyors. Nevertheless, it gives the lower margin of the real extent of the industry. We do think, on the basis of our knowledge of the city, that the real figure could exceed 10% more.

According to the survey, there are in Jepara a minimum of :

- 14 091 small units (92 %)
- 871 medium units (6 %)
- 309 large units (2 %)

	Workshops (Figure 5)	Showrooms (Figure 9)	Log parks (Figure 6)	Sawmills (Figure 7)	Warehouse (Figure 8)	Ironmongery (Figure 10)
Small units	12 202	1 250	763	158	210	82
Medium units	435	230	133	74	219	18
Large units	126	68	57	37	146	82
Total	12 763	1 548	953	269	575	109

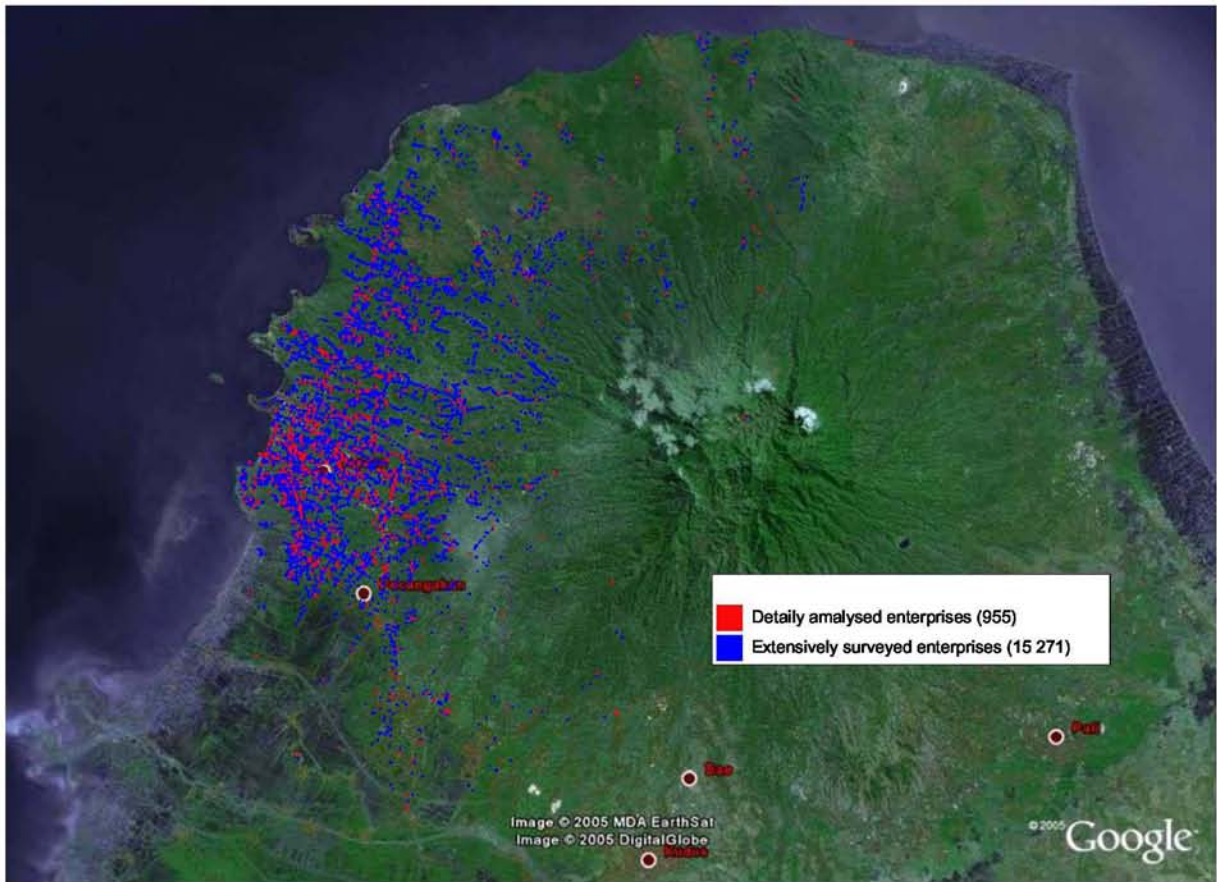


Figure 4 : Satellite view of Jepara, with location of the enterprises described by the database

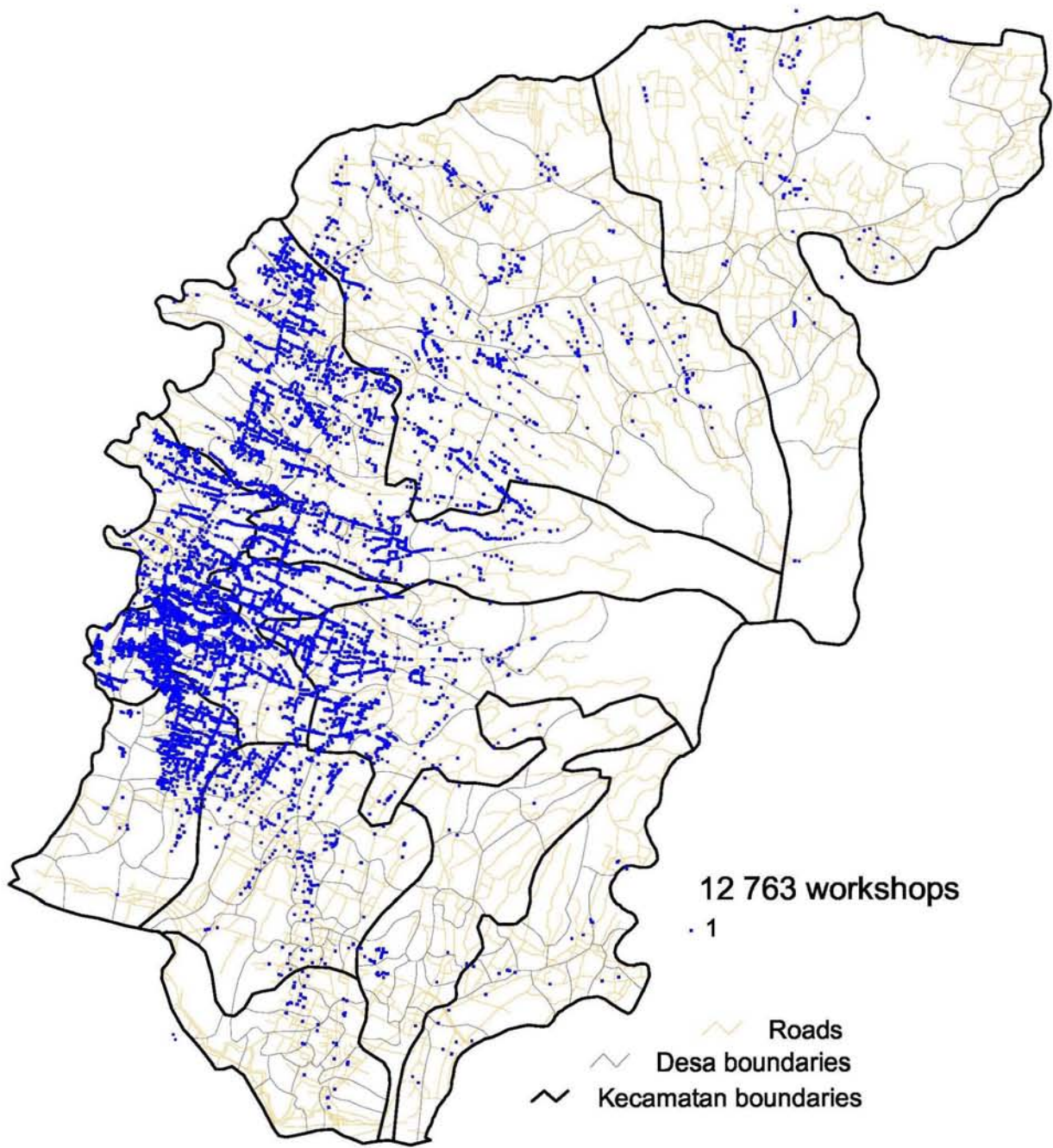


Figure 5 : Location of the workshops

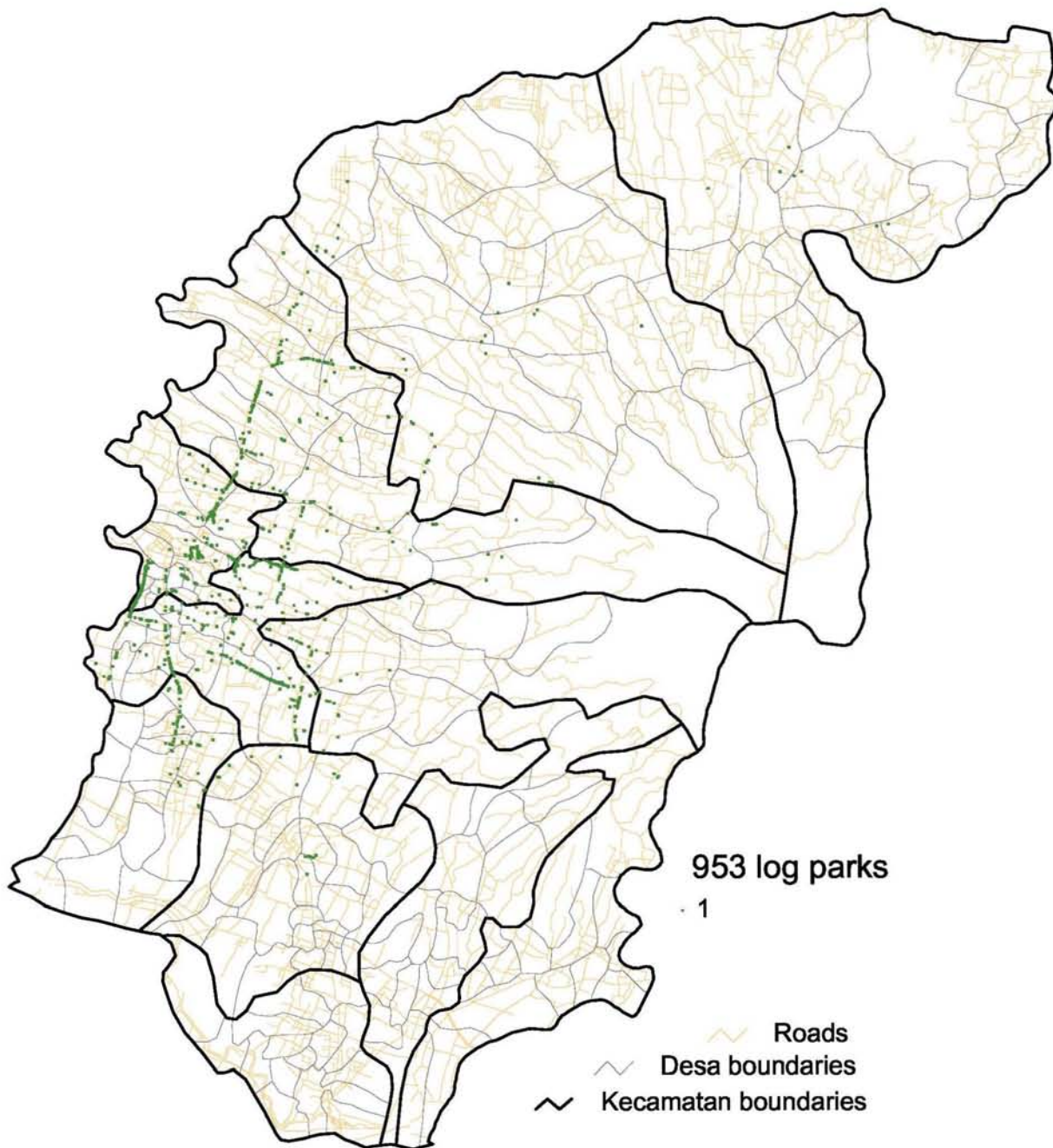


Figure 6 : Location of the log parks

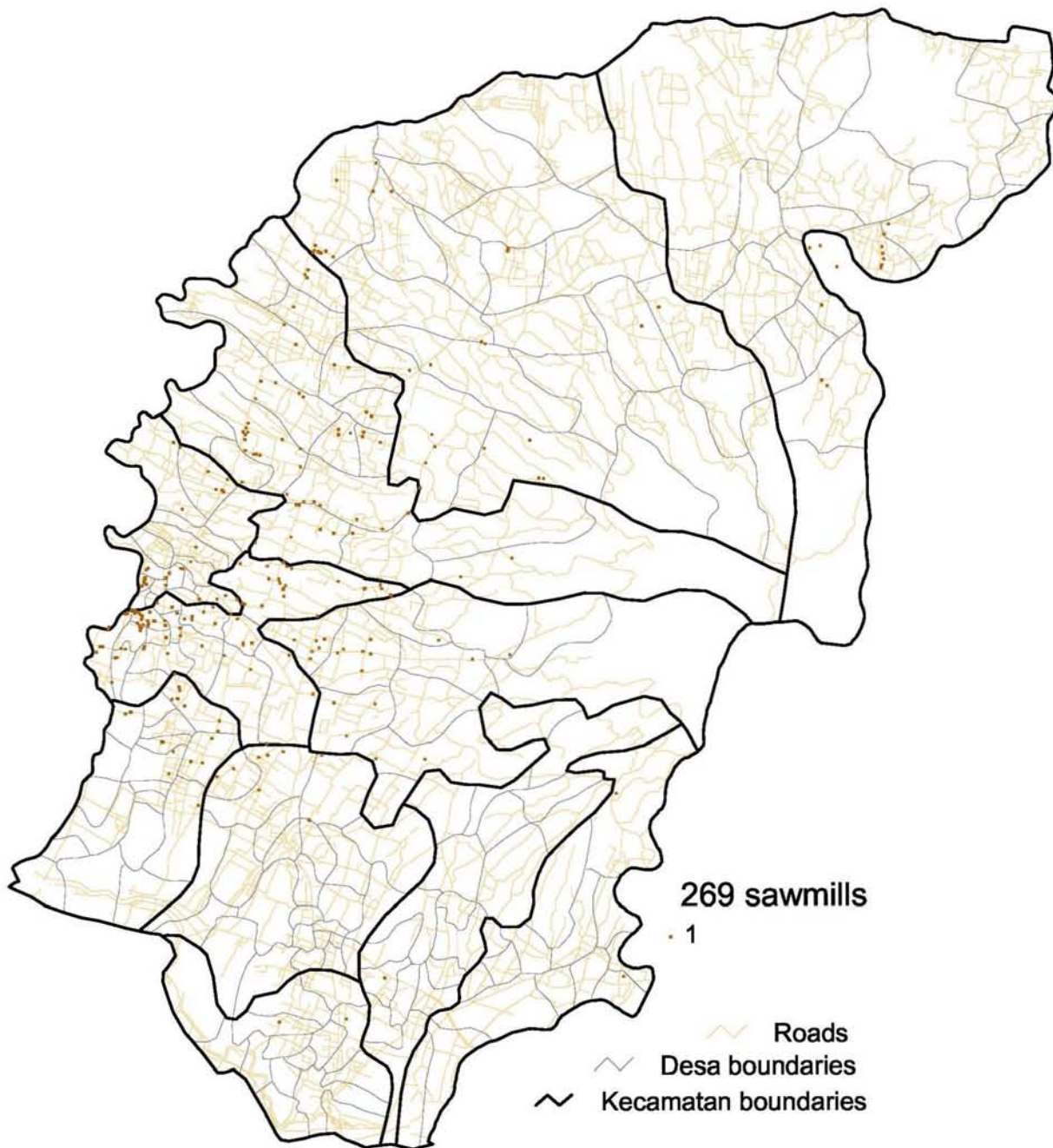


Figure 7 : Location of the sawmills

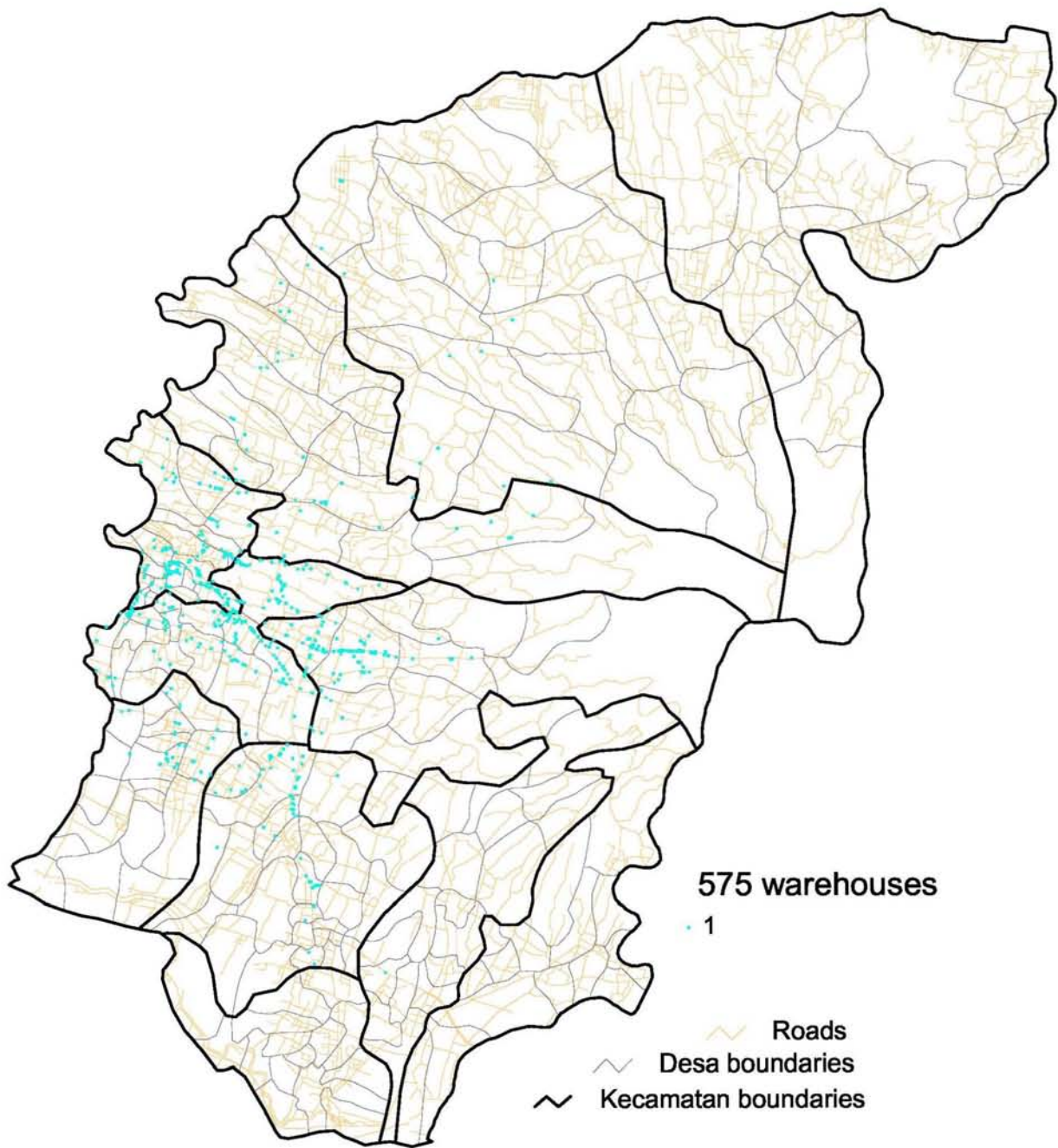


Figure 8 : Location of the warehouses

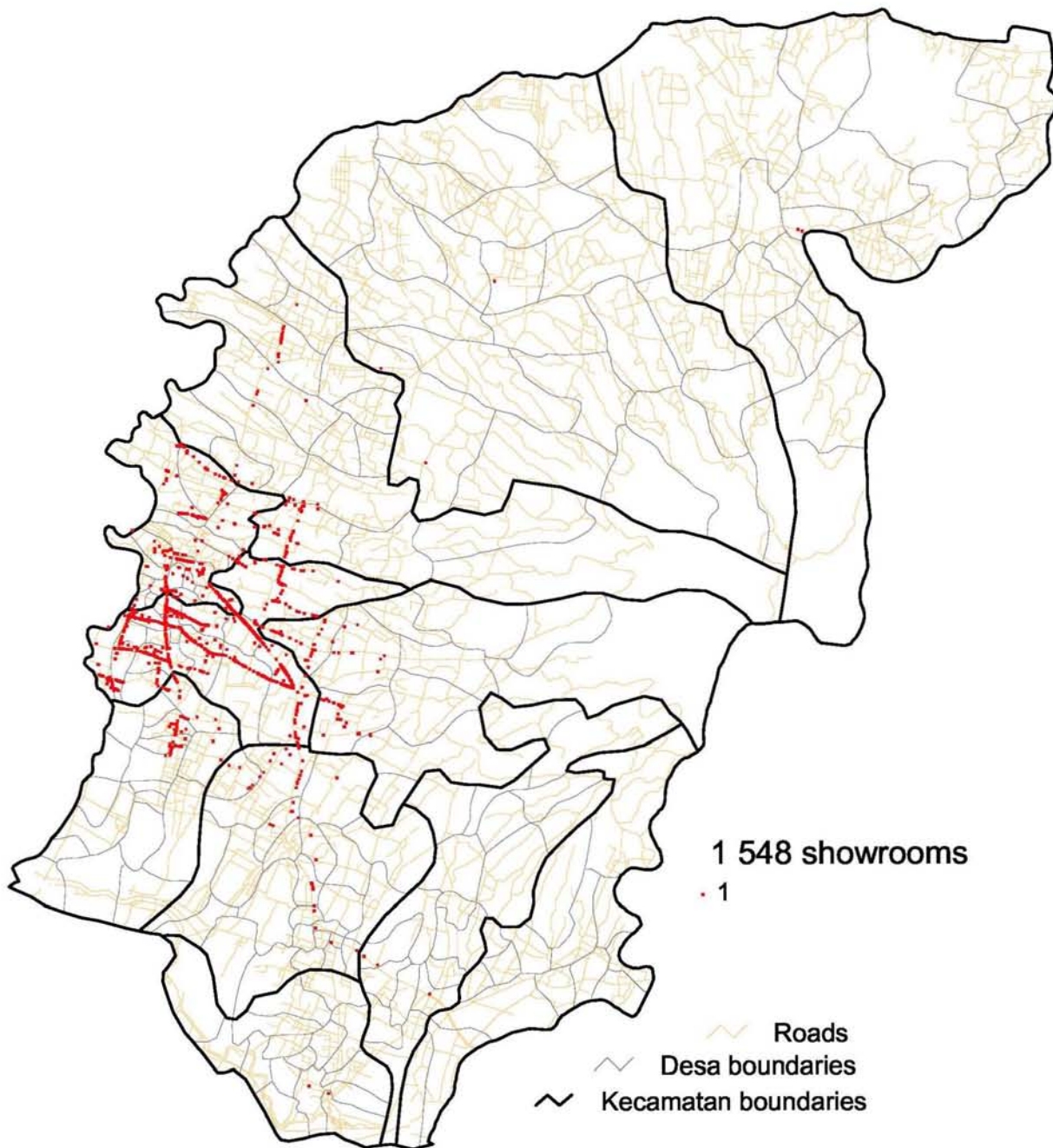


Figure 9 : Location of the showrooms

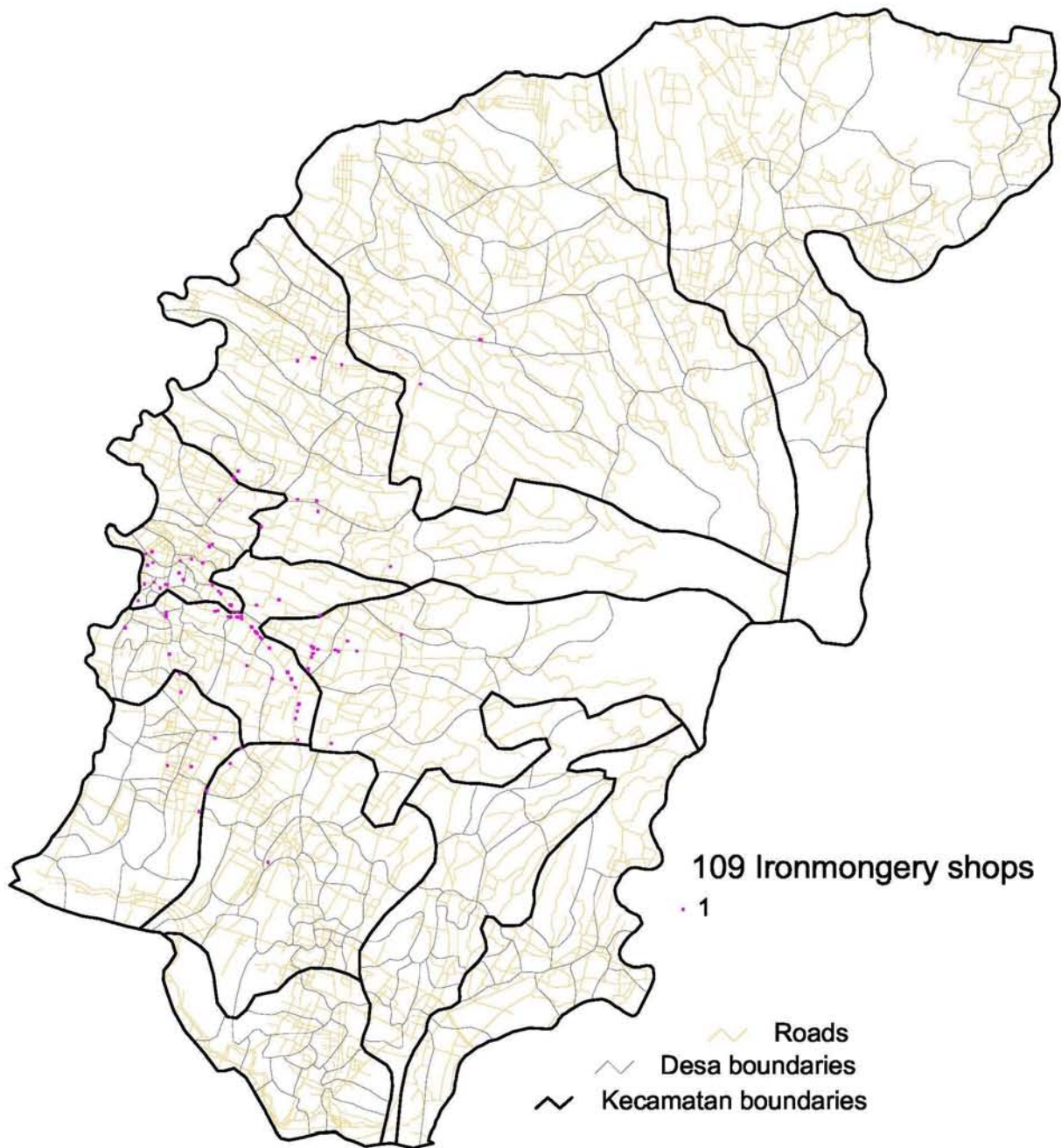


Figure 10 : Location of the ironmongery shops

3.2 The structure of the wood industry of Jepara, according to the detailed survey by sampling

958 enterprises (units of all sizes) are analysed in details, with a statistic sampling according to their spatial concentration.

949 products categories are described with

7 units	describing 4 different categories of products
24 units	describing 3 different categories of products
56 units	describing 2 different categories of products
862 units	describing only 1 category of products

The excessive proportion of enterprises dealing with only one category of product highlights the very high degree of specialisation of the enterprises within Jepara.

As well, an excessively low proportion of these enterprises appear to be the combination of several families, and most of the enterprises seem to be under the dynamic of only one extended family:

958 enterprises are describing they ownership as the following:

2 units	describing 3 different social structures or lineages
41 units	describing 2 different social structures or lineages
915 units	describing 1 social structures or lineages

In the contrary, almost all the enterprises declare to have at least one other regular partner enterprise, even if there are no links in the ownership of the enterprises.

In other words, there is a high level of connexion between the enterprises of Jepara, but this connexion is not established through ownership or classical joint ventures, but through other ways.

3.3 Employment generated by the wood industry

The number of workers within the sample is 11 276 (4 092 temporary, and 7 184 permanent workers). The extrapolated number of workers involved in the furniture industry is around 176 000 workers (from 173 000 to 179 000,)

	Workers	%	Standard Error
Non permanent workers	63 462	36	1 619
Permanent workers	113 007	64	1 716
Total	176 469	100	3 335

The total employment is mapped for each Desa (villages), in Figure 11.

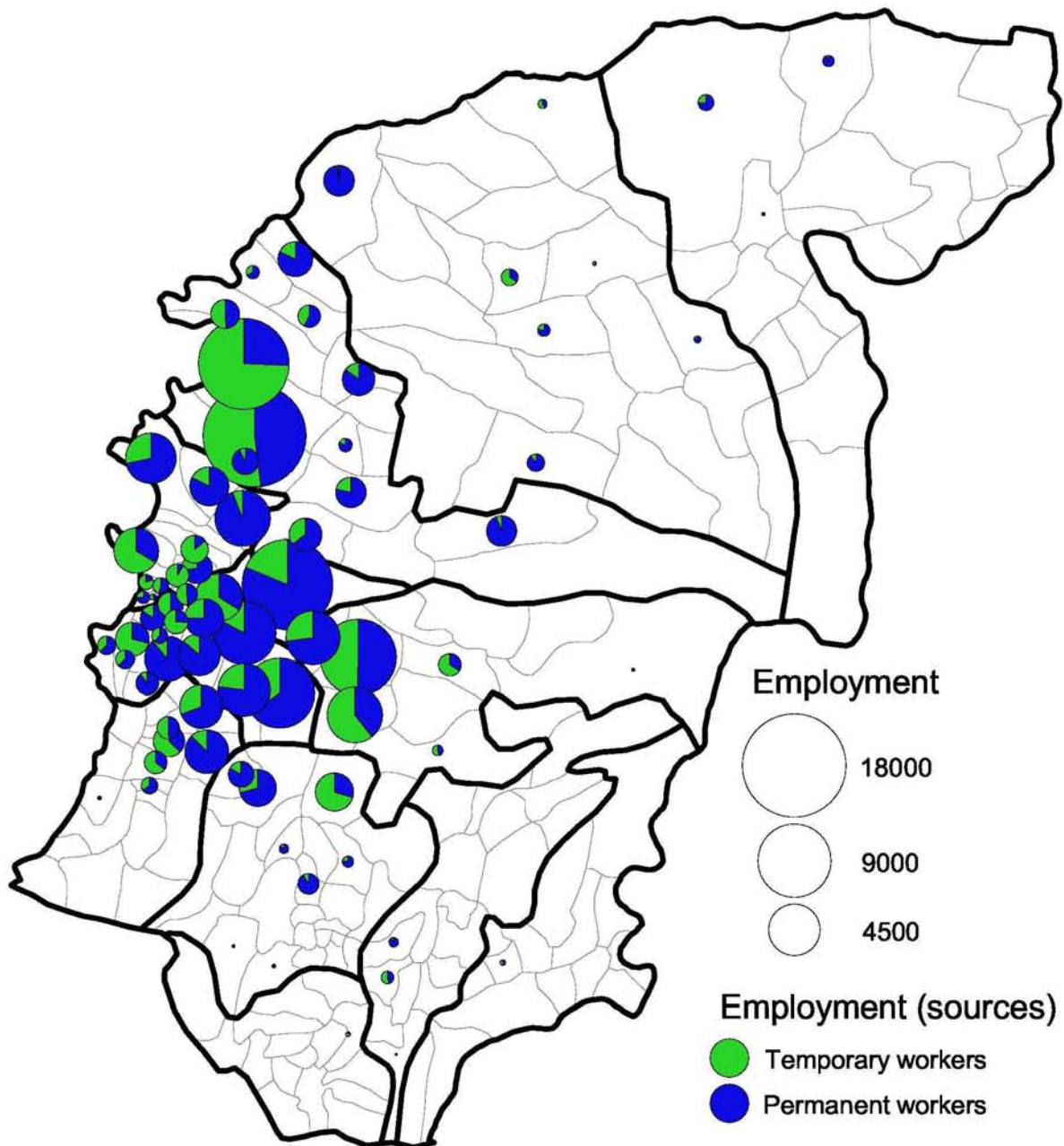


Figure 11 : Total employment, per administrative Desa (villages)

3.4 Added-value generated by the wood industry

The cashflow declared by the units of the sample is 825 billions Ruppiah (sales/year). According to the various spatially weighted extrapolation methods, the cashflow of Jepara furniture industry is assessed as ranging from 11 971 billions Ruppiah to 12 255 billions Rp/year (Figure 12), that is to say an order of 1 billion Euro/year.

At the Kabupaten level, the average relative cashflow per worker is 74 millions Rp/worker (with a precision of 71 to 76 millions Rp/worker), but the dispersion is high and the spatial heterogeneity is very large among the villages (Figure 13). Some villages present less than 1 million Rp/year/worker of added value, while others present more than 600 millions Rp/year/worker. No spatial pattern seems to explain the differences, thus it is not linked to the industrial concentration nor with the spatial concentration. This probably corresponds to the existence of very specific businesses, scattered over the territory. Further investigations have to be conducted regarding this point, towards the share of permanent / temporary workers, or the nature of the products and the processed furniture, etc.

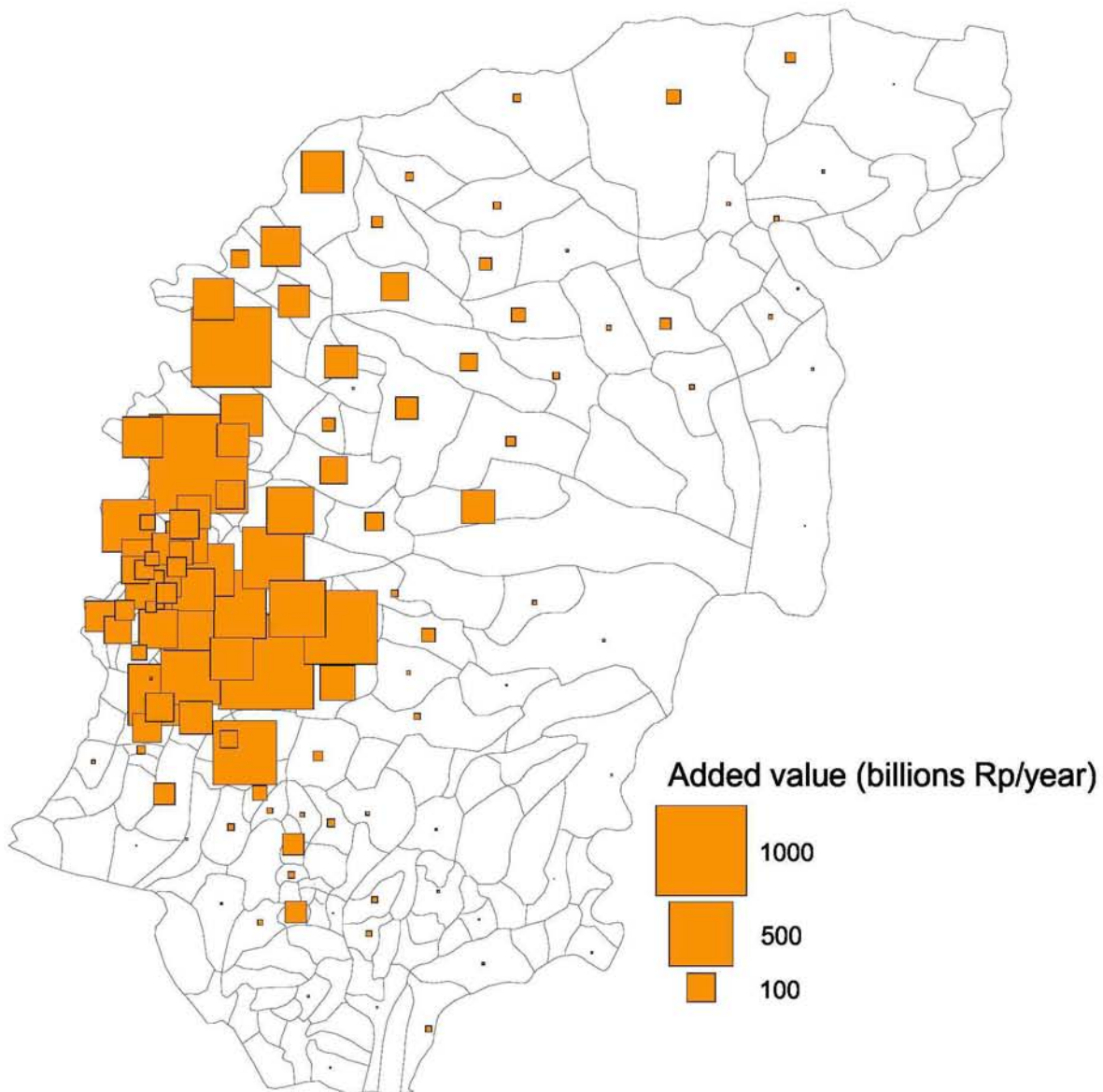


Figure 12 : Added value of the furniture industry, per Desa (village)

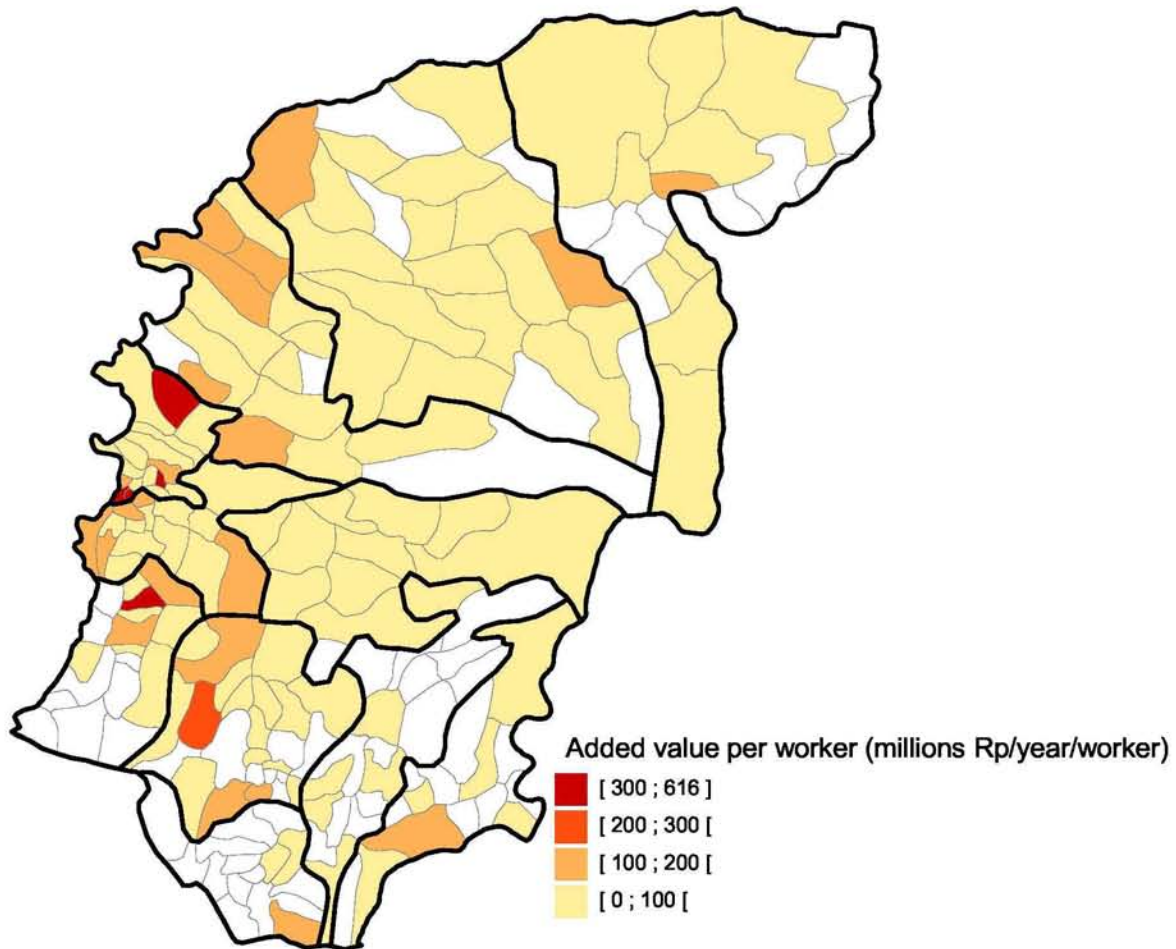


Figure 13 : Added value of the furniture industry per worker, for each Desa (village)

3.5 Round wood consumption

Within the sample, only 321 enterprises declare having a direct log supply. All the other enterprises purchase components, pieces, sets or even pre-finished and finished furniture. This sample thus consumes annually 154 353 m³/year of round wood (482 m³/year/enterprise).

3.5.1 Calculation of the absolute possible maximum

In a first approach, if we assume that all of the above cited enterprises effectively directly get their supply from outside Jepara, the total round wood consumption of Jepara is estimated to be approximately 2,2 millions m³/year.

At the level of whole Jepara, 1 fulltime standard employment/year is sustained in average by a maximum of 12 to 13 m³ of round wood.

3.5.2 Realistic assessment

In an alternative approach, we assume that a part of this input is in fact incorrectly declared by the actors, thus leading to a part of the volume being counted twice.

Indeed, fine analysis of the round wood consumptions of the sampled industries shows that the local industries can be grouped into two gross categories :

- Workshops which source directly their raw material from outside Jepara.
- Workshops which supply indirectly their raw material, purchasing it to independent log parks & retailers from Jepara.

These latest workshops may not have the capital to buy all the necessary logs : They either use loans from their final buyers, either split their supplies in a lot of small subsequent small purchases, or both. These workshops also actually subcontract the first saw milling, just after buying the logs, before bringing the logs to their working place. The sawmilling mainly consists into splitting the logs into planks, later used to make the components. The recovering rate of this first process-step thus is approximately 94,45 % (mean calculation based on the data provided by three sawmills, respectively sawing 3 110n 576, and 288 m³/year of logs).

Thus the volume of input declared by the log parks might be counted a second time when entering the sawmill (under a sub-contract), before to enter other workshops under the form of sawn timber. The fact that the annual input volume declared by log parks and by sawmill is very similar (61 115 m³ vs 61 497 m³), supports this hypothesis.

Source of the logs	Units	Volume (m ³ /year)	Mean (m ³ /year/enterprise)	Standard deviation (m ³ /year/enterprise)
Outside Jepara	266	43 631	164	396
Log parks & retailers	36	61 115	1434	3710
Sawmills	19	61 497	3237	2614
Total	321	Non applicable	Non applicable	Non applicable

In such a case the direct round wood supply of Jepara is assessed as approximately 707 000 m³/year, and the indirect supply (through independent log parks and subcontracting sawmills) is assessed as approximately 846 000 m³/year, totalising 1,55 millions m³/year.

At the level of whole Jepara, 1 fulltime standard employment/year is sustained by 8 to 9 m³ of round wood.

3.5.3 Synthesis of the two assessment methods

At this stage of the analysis, it is impossible to know what is the exact real figure, between these two numbers. The two results are anyway consistent, providing a total input of round wood in Jepara between above 1,55 and under 2,2 millions m³/year, thus implying that any full employment is sustained by an average of 8 to 13 m³/year, with a most probable average value of 9 m³/year.

3.6 Production analysis

3.6.1 Sawmills

The 269 sawmills of Jepara essentially process the logs into simple planks, and do not transform the material further (the workshops directly process the pieces and furniture components out of these planks). Thus the recovering rate is very high in the sawmills : according to the data provided by three sawmills of various sizes (respectively 966, 256, 58 m³/year), the average recovering rate is 94, 45 %.

3.6.2 Relationships between the workshops

Out of a sample of 955 different enterprises, we find that 21 % of them consist in several units related to one single owner. This suggests a very dense and intricate web of relationships between the units, not taking account a network based on the kinship, probably more intricate.

Nb of enterprises per owner	Nb of cases	% among the enterprises
11	1	1
10	1	1
8	1	1
7	3	2
5	5	3
4	6	3
3	8	3
2	40	8
Total	65	21

Beside that, the high level of division of the process steps between the enterprises, is reflected by the fact that 78 % of the workshops declare to work in close relationship with partners.

Number of enterprises declaring regular partners		%
1 partner	723	76
2 partners	18	2
Total	741	78

3.6.3 Structure of the production

The enterprises of Jepara can be categorised into 3 groups. The first group consist into the most integrated enterprises, where the supply is constituted by round wood, producing essentially finished or pre-finished products.

The second group consists in enterprises (log parks and saw mills) which are specialised in the first stage of transformation, producing very simple sawn timber for the third group.

The third group consists in workshops which supply is constituted by sawn timber, components, pieces, sets of products, etc. at various stages of the transformation.

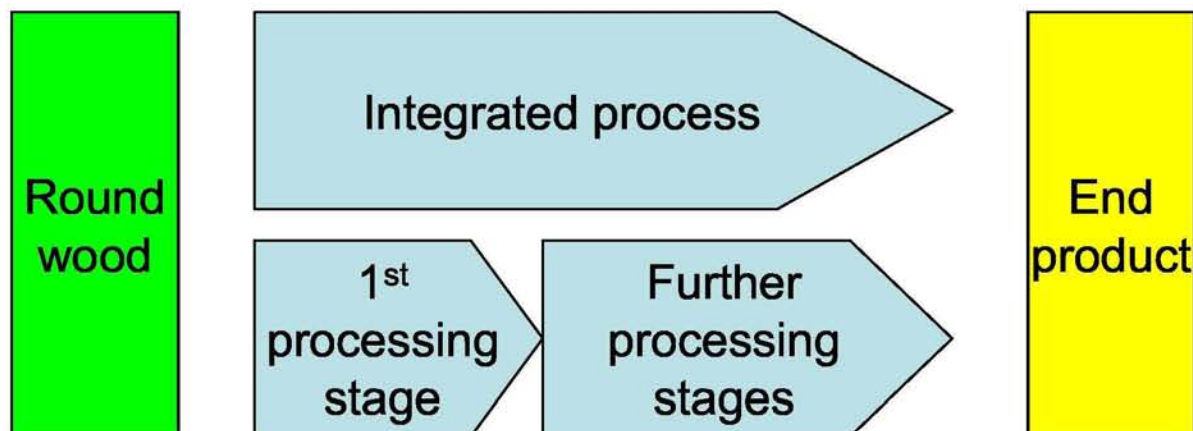


Figure 14 : Analytical structure of the production in Jepara

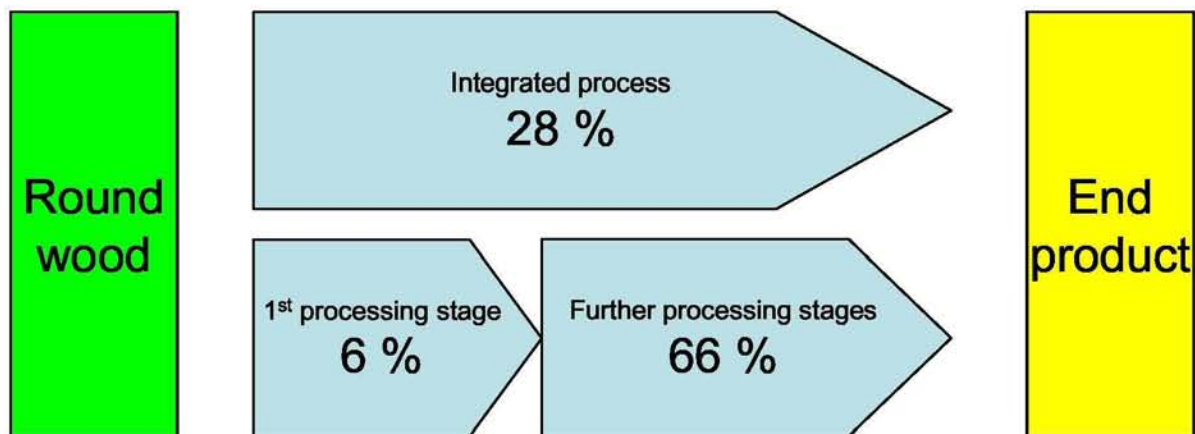


Figure 15 : Structure of the production in Jepara, in % of the total number of enterprises

Structure of the production in Jepara, in % of the total number of enterprises

	Global proportion
	%
Integrated process	28
1st processing stage	6
Further processing stages	66
Total	100

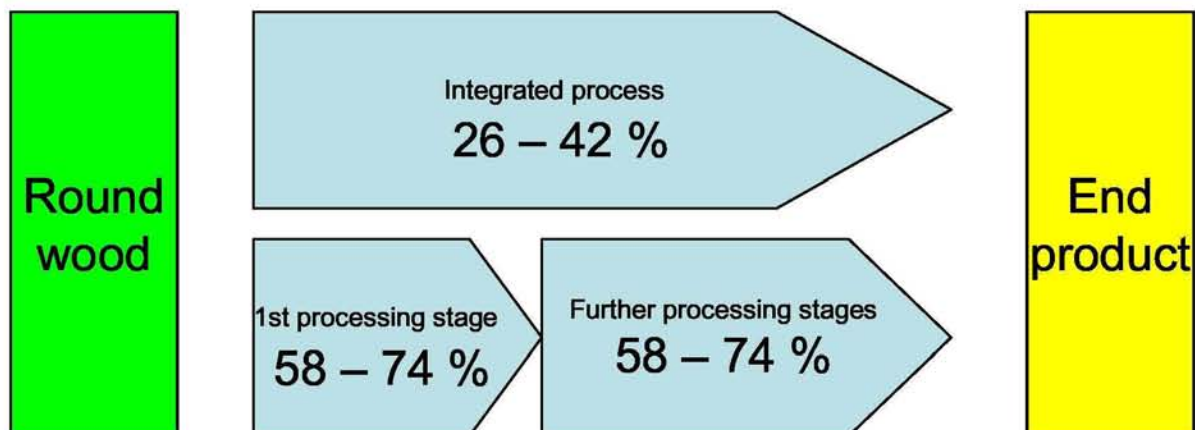


Figure 16 : Structure of the production in Jepara, in % of the volume (round wood equivalent), with respect to the error margin

Structure of the production in Jepara, in % of the volume (round wood equivalent), with respect to the error margin

	Error margin	Possible value
	%	%
Integrated process	26 to 42	34
1st processing stage and further processing stages	58 to 74	66
Total		100

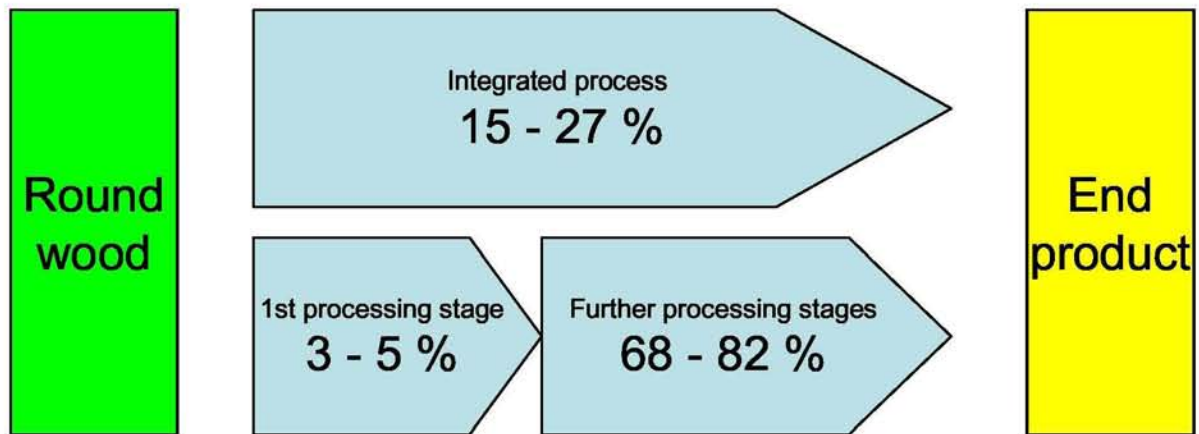


Figure 17 : Structure of the production in Jepara, in % of the total employment, with respect to the error margin

Structure of the production in Jepara, in % of the total employment, with respect to the error margin

	Permanent employment		Temporary employment		Global proportion
	Workers	%	Workers	%	
Integrated process	2 213	27	674	15	23
1st processing stage	385	5	151	3	4
Further processing stages	5 538	68	3 671	82	73
Total	8 136	100	4 496	100	100

4 Discussion

5 Conclusion

6 References

7 Annexes : maps of woodworking industry in Jepara, according to the analysed sample

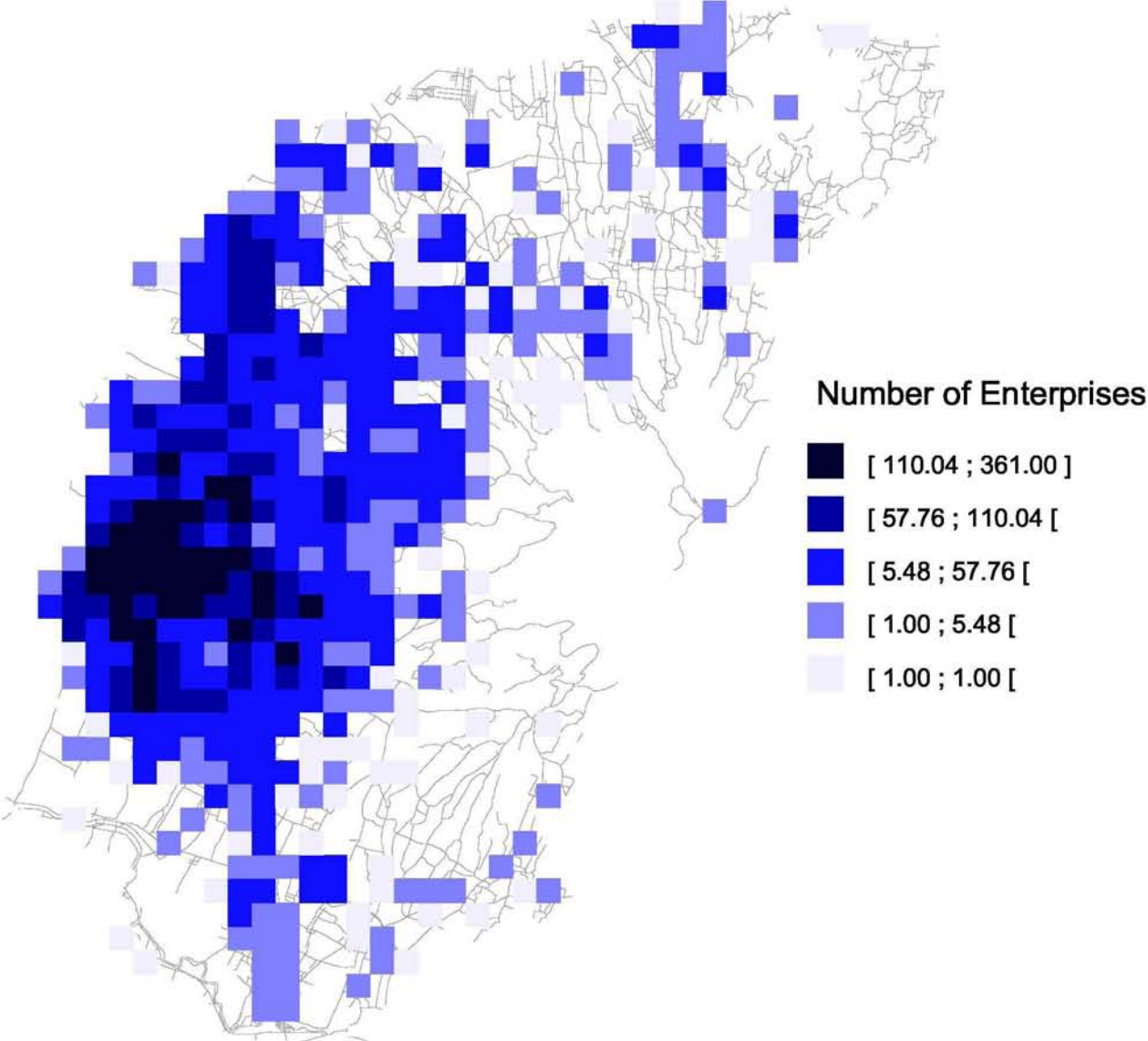


Figure 18 : Number of enterprises over the Jepara territory

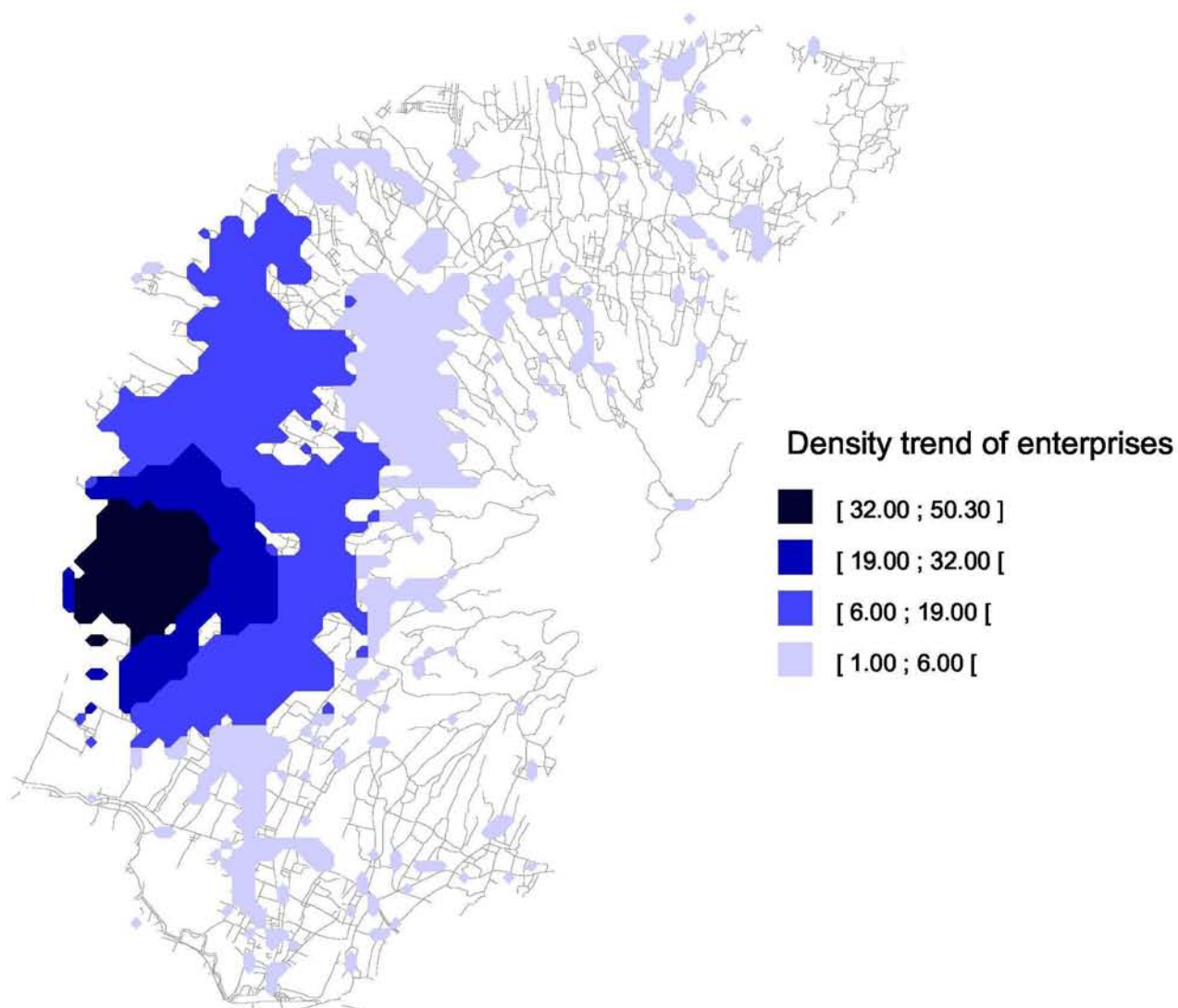


Figure 19 : Computed density trend of enterprises in Jepara

This figure doesn't represent the actual density of the enterprises over the territory. A mathematical method is applied to discriminate the trend of density, and it is figured in this map. In this case, the trend is very clear, with the main concentration being in the old part of the city.

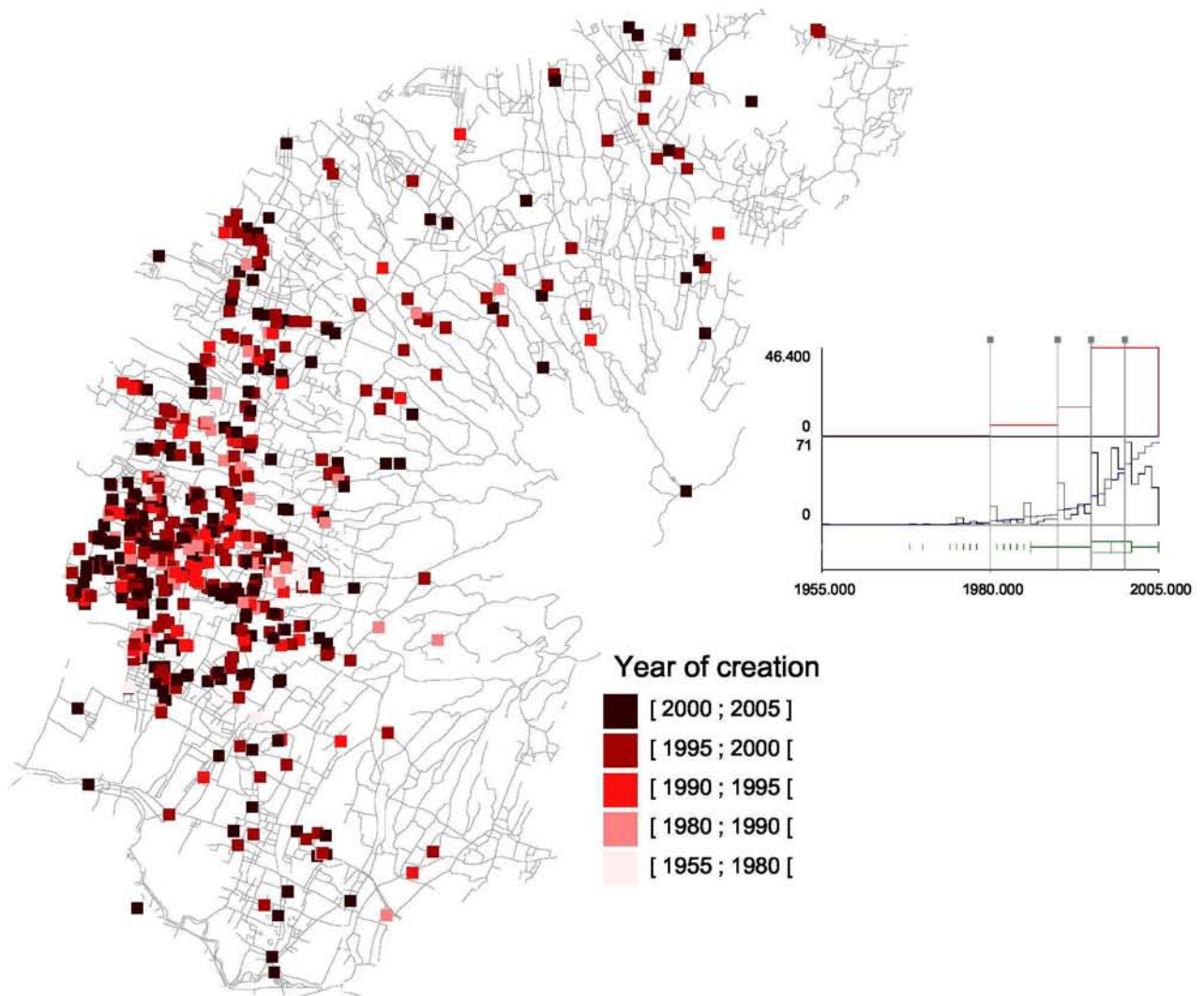


Figure 20 : Year of creation of the enterprises, within the sample

The year of creations are represented for each sampled enterprise, with classes of 5 years and one class for all the creations from 1955 to 1980. No spatial trend clearly appears. The climax of the enterprise creation has been around year 2000. A decrease of the creation rate possibly appears since 2000, but the differences are not statistically significant. This will be confirmed or infirmed in the coming years.

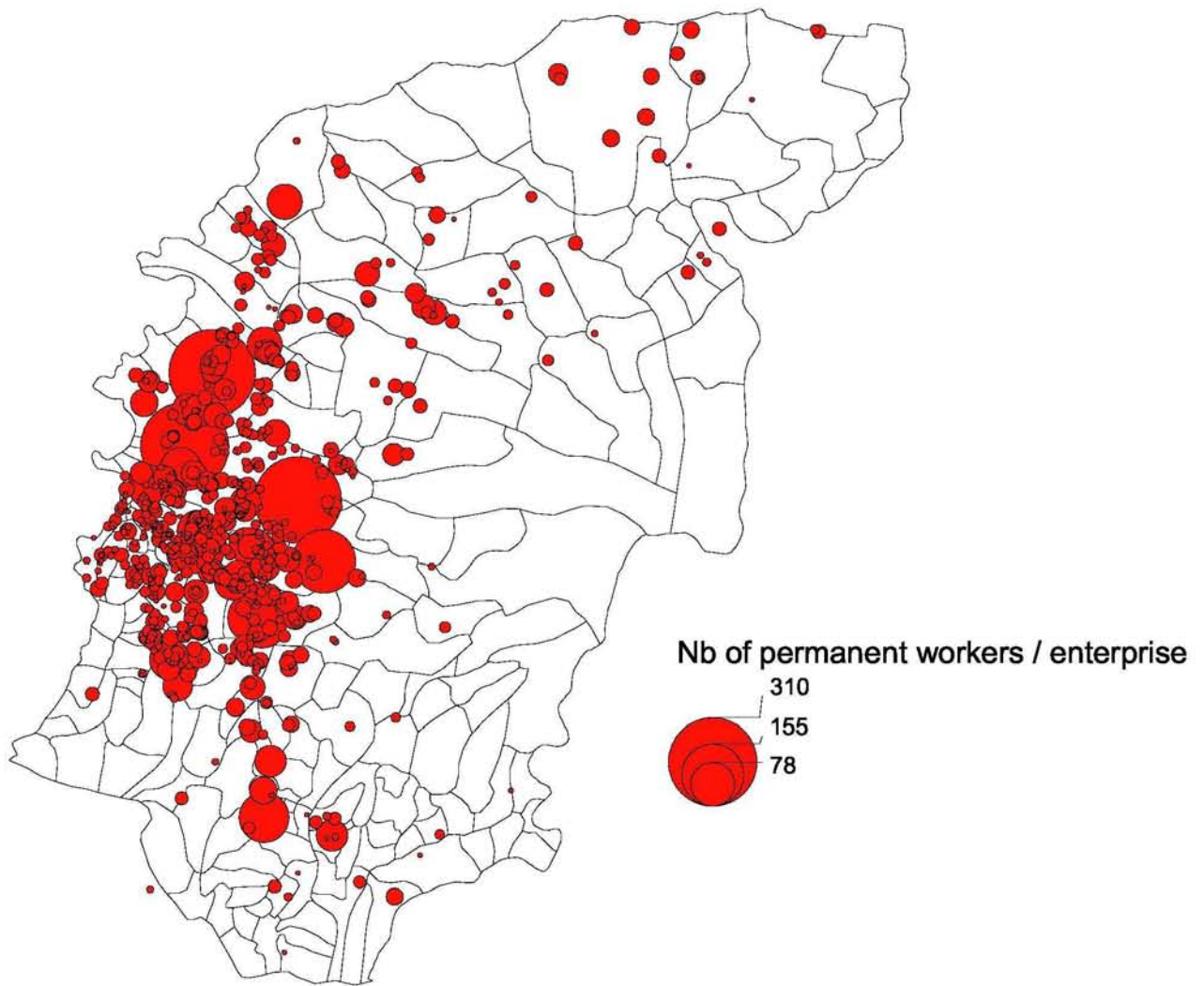


Figure 21 : Number of permanent workers per enterprise

According to the sample, most of the enterprises of the Jeparan wood industry are of very small size. A few of them are big or very big. They are also located along the main roads.

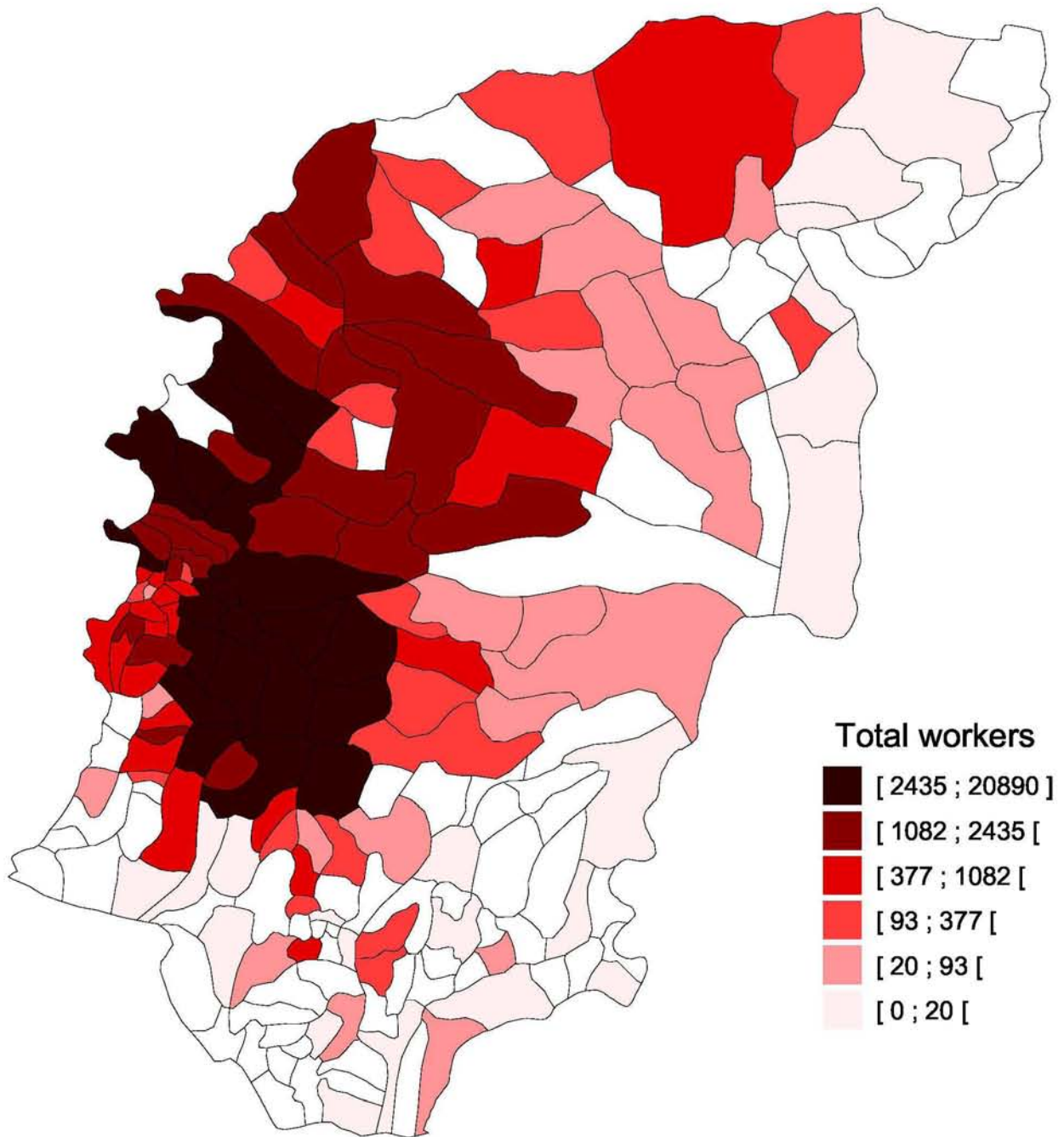


Figure 22 : Number of permanent and non permanent workers in each Desa (village) of Jepara

The main concentration of workers is not exactly centered over the old city of Jepara, while it could be, because the concentration of enterprise is. In fact, the workers concentration is highly influenced by the big enterprises.

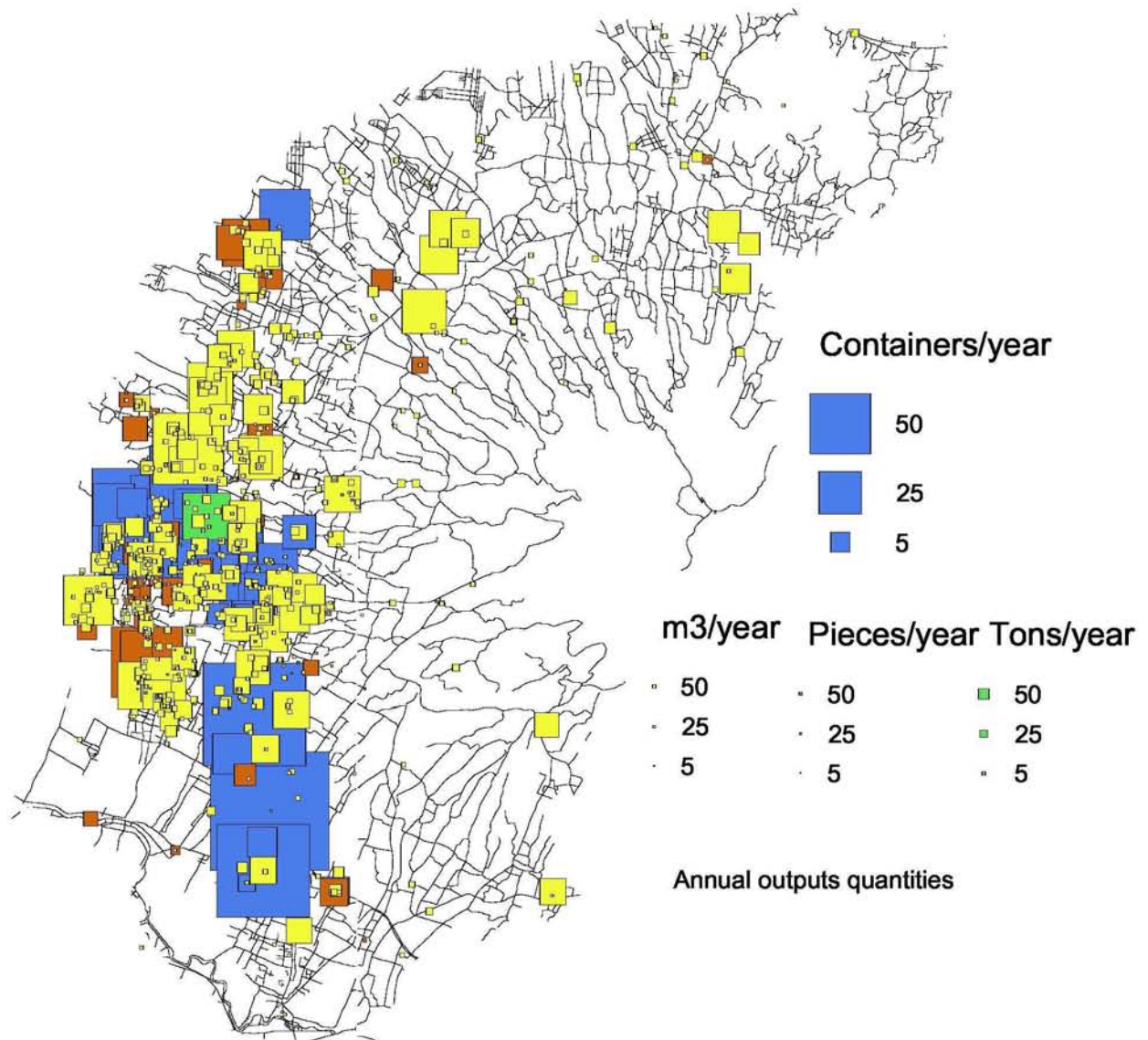


Figure 23 : How the enterprises of Jepara express their outputs (containers, pieces, tons and m3)

The enterprises expressing their outputs in containers and tons (respectively blue and green color) are mainly producing finished furniture. They seem to favour locations along the main road. The enterprises expressing their outputs in m3 or pieces (respectively yellow and brown color) are mainly producing components for the Jepara market.

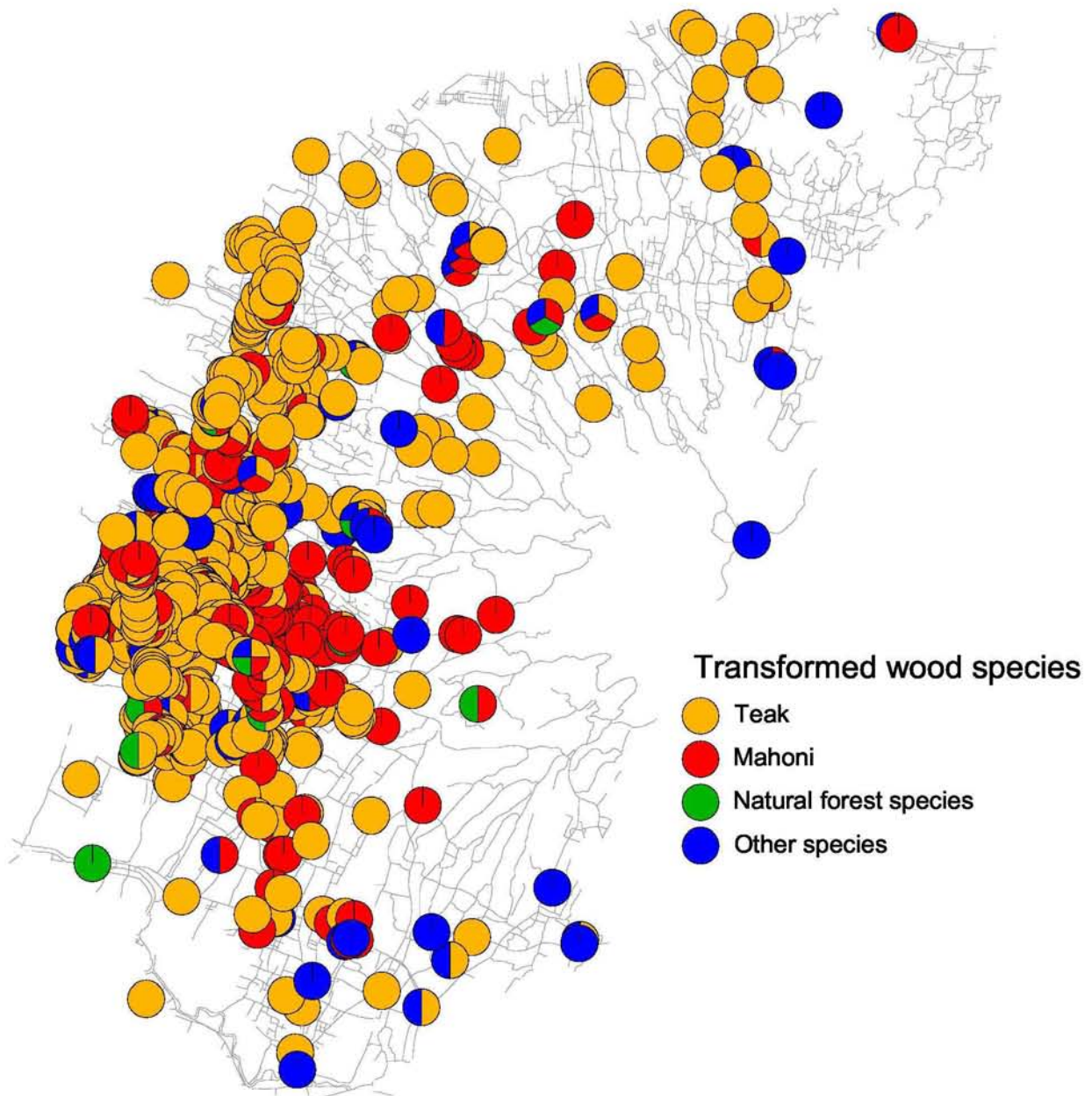


Figure 24 : Main wood species processed in Jepara

The main processed wood specie in Jepara is the teak, followed by the Mahogani locally named as “Mahoni”. Other species of natural forest are figured in green, while the remaining diverse species, including acacia, are figured in blue.

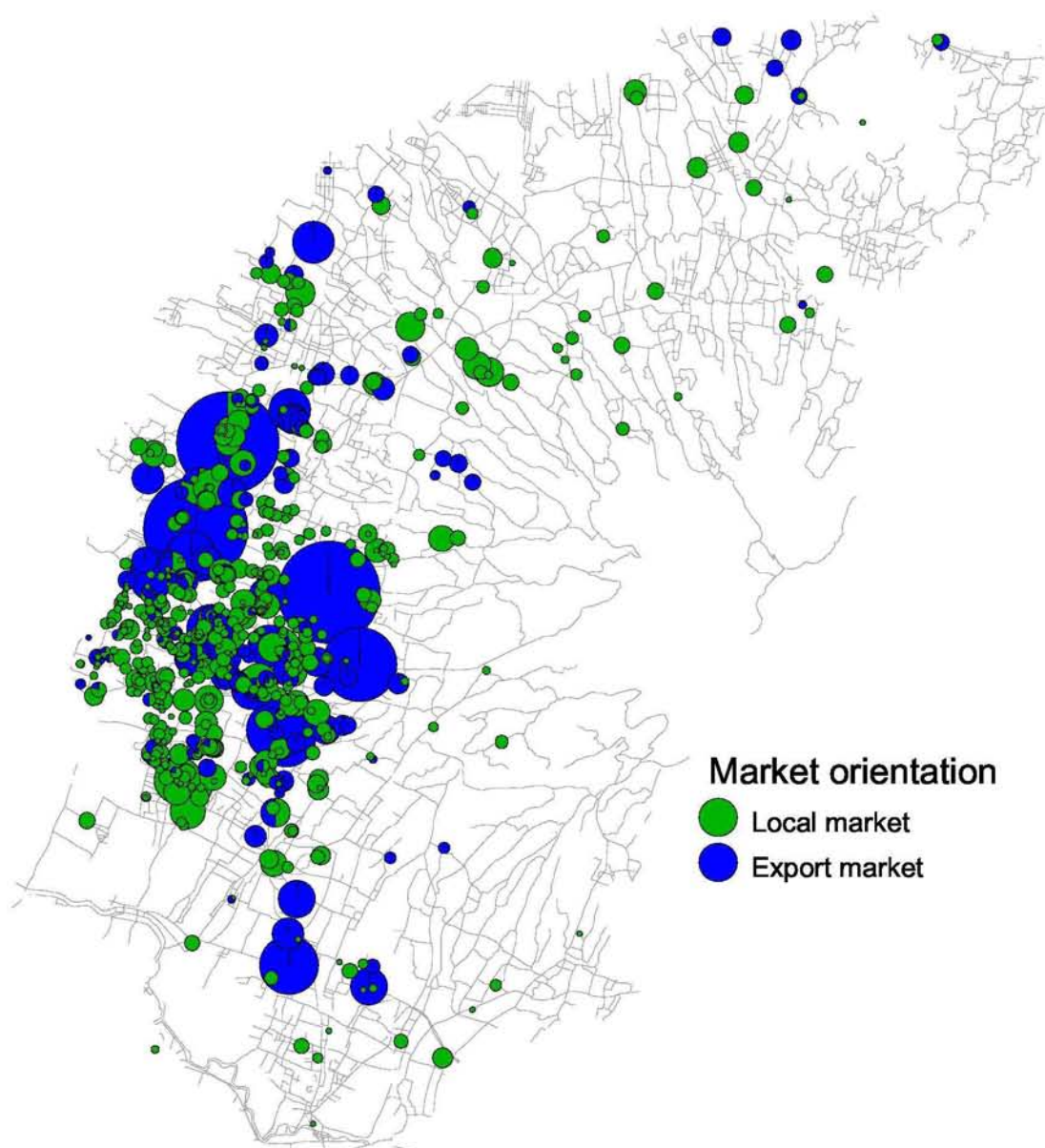


Figure 25 : Orientation of the production towards export or local markets

The colours of the circles correspond to the main markets of the enterprises, and the size of the circles is proportional to the total number of workers within each enterprise.

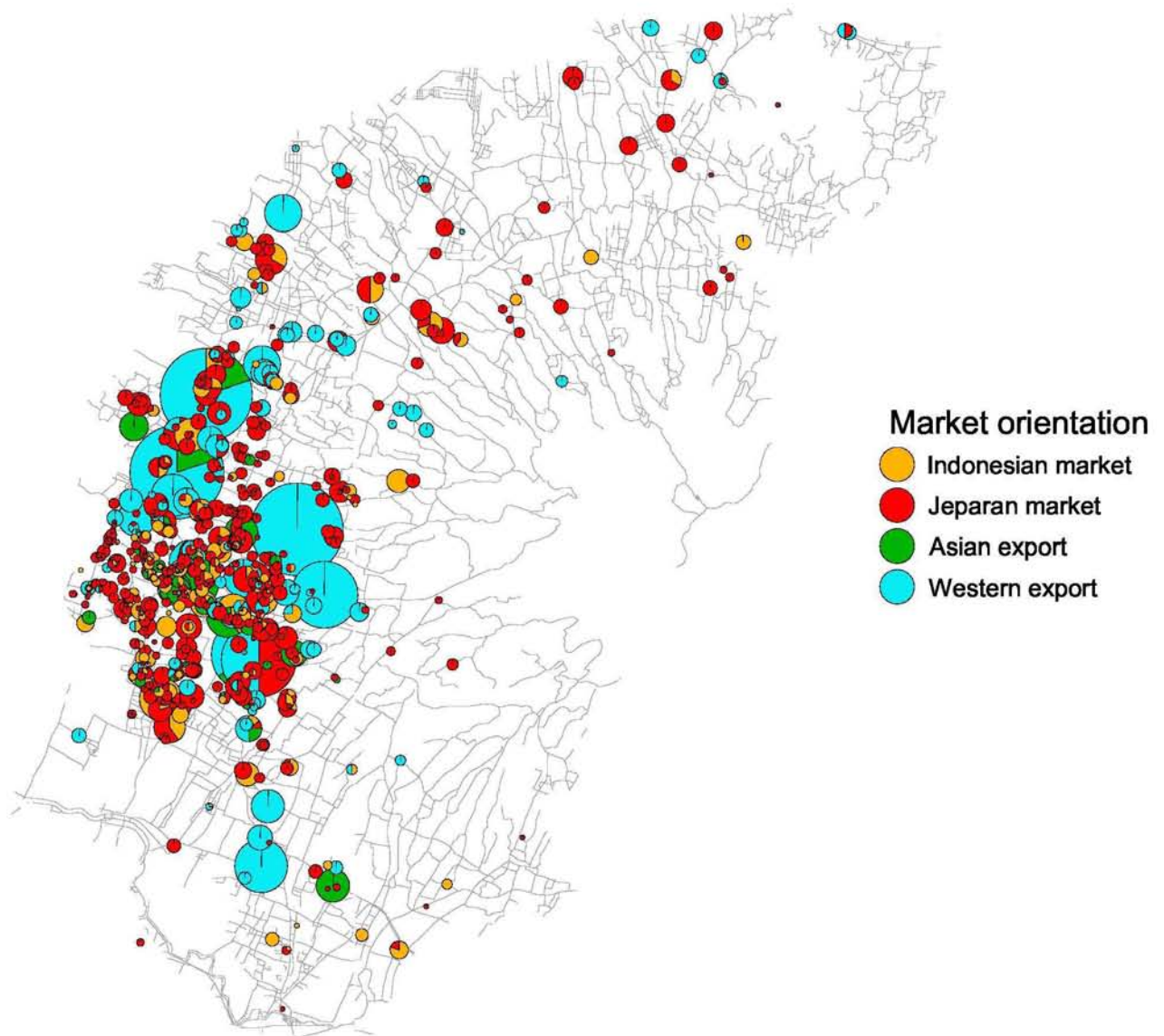


Figure 26 : Detailed orientation of the production towards export or local markets

The colours of the circles correspond to the specific markets of the enterprises, and the size of the circles is proportional to the total number of workers within each enterprise.

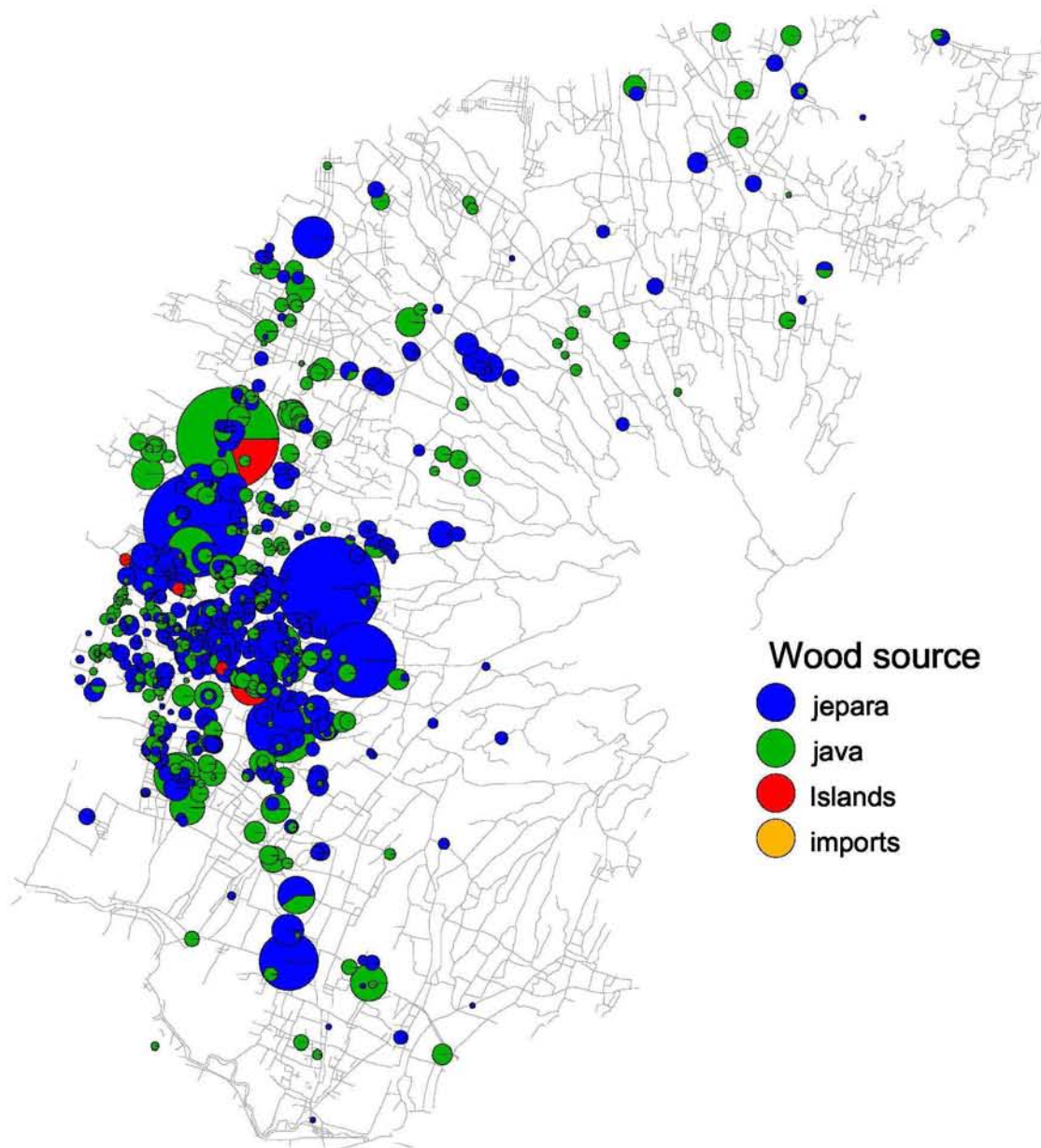


Figure 27 : Source of the wood used in each enterprise

The colours of the sectors correspond to the place where the wood used in each enterprise is declared as coming from, and the size of the circles is proportional to the total number of workers within each enterprise.

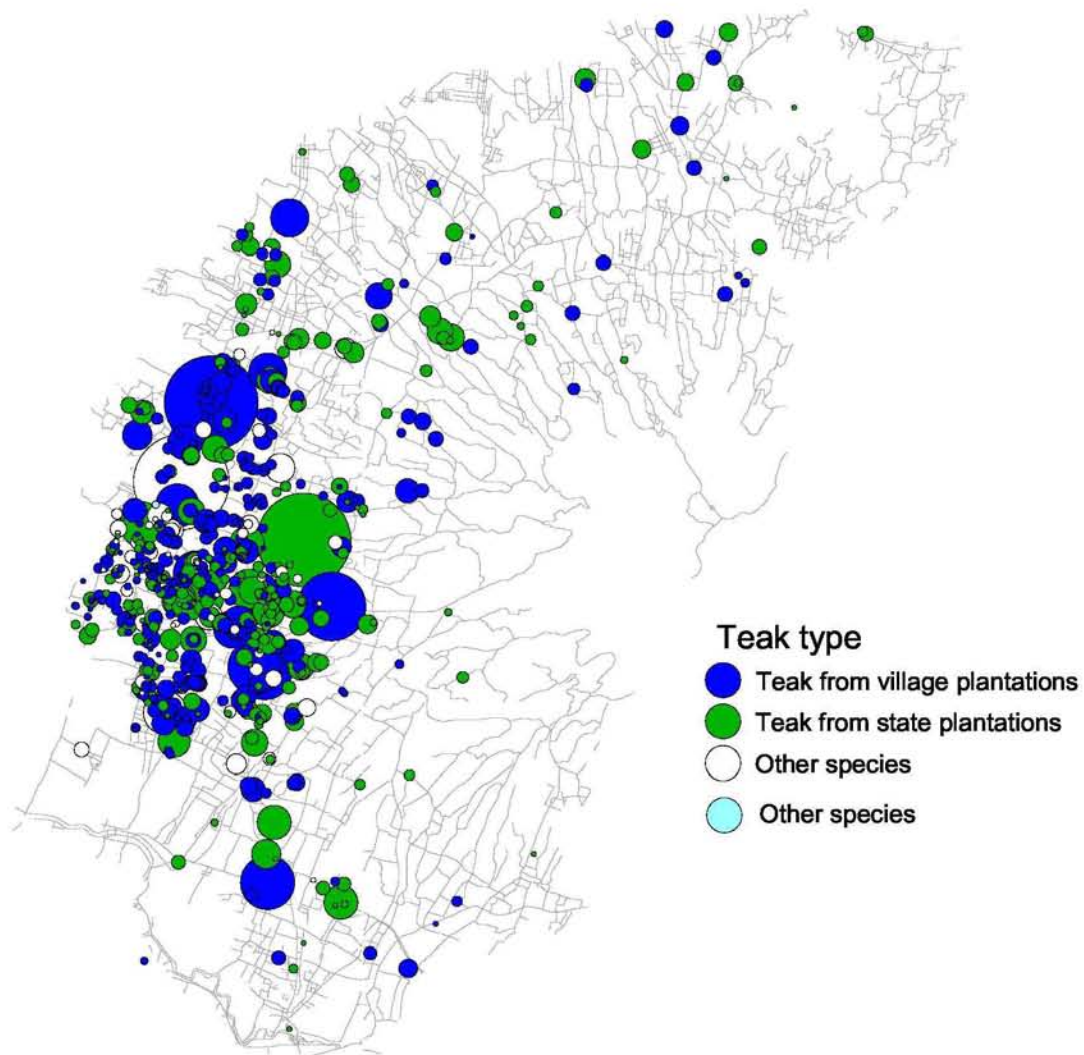


Figure 28 : Qualification of the wood mainly used by the enterprises

The enterprises using mainly some teak coming from the villages (also known as “Jati kampong”) are figured in blue. The enterprises using some teak coming from State plantations are figured in green. White and light blue colours are used for enterprises which main species are other than teak. The size of the circles is proportional to the total number of workers within each enterprise.