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Standard application in vegetable production in Vietnam - between path dependence and economic incentives. The case of Hanoi's city

Proposition de communication

Thèmes : Agriculture, Développement au Sud, Politique agricole

Hai Vu Pham, hai-vu.pham@inra.fr
UMR 1041 CESAER AgroSup Dijon - INRA, Université Bourgogne-Franche Comté

Abstract :

To face food safety problems, Vietnam has promoted standard's uses in agricultural production. The city of Hanoi provides an interesting case study. Hanoi supports the use of 3 standards in urbain vegetable production : VietGAP, RAT and Organic. Much of funding has been given to build infrastructure, analyze safety conditions of farms, and train farmers in specialized production zones. These operations are expected to help deliver safe vegetable to the 7 millions city's inhabitants, who consume mostly local products. Our study looks into the application of these standards. We use statistics from the General Statistic Office of Vietnam, and surveys upon Hanoi's cooperatives and farmers to understand the situation. Our result show that the success of this policy is limited, because Hanoi's agriculture is much depending on cooperative's instruction on one side, and by the strong demand for conventional vegetables on the other side.

Key words : standard application, urbain vegetable, production cost, food safety policy, cooperative

Introduction

From nearby two decades, Vietnam has engaged in building safety standards for agricultural products as an answer to the problem of unsafe foods (Pham and Dao, 2016). The result is modest in regard to enthusiasm and investments put forward. The first standard - RAT - was developed in 1998 to orientate the production of safe vegetables. RAT stands for "*Rau An Toan*", which refers to the word "*safe vegetable*s" in Vietnamese. Following to RAT, two other famous standards have seen the day: Organic and VietGAP labels. Introduced to Vietnam in 2004 by ADDA[1], a Denmark non-governmental organization, the organic label is approved by the Vietnamese government in 2006 (Pham and al., 2007). Almost at the same time, the standard of VietGAP was introduced to farmers by Syngenta foundation. Syngenta foundation is a non-profit cooperation structure of the international chemical company Syngenta Co.ltd. VietGAP was then adopted by the government in 2008. Today, it is the most known safety signal for

[1] We consider the Agricultural Development Denmark Asia (ADDA) to be the founder of organic agriculture model in Vietnam. Organic productions had been developed in Vietnam by private companies before the ADDA's project, but all of them are exported to foreign markets, and are unknown by Vietnamese consumers. Others producers claim to have organic production (non-use of pesticide), but they have no certification and no reliable protocol of production.

Vietnamese foods. Following to FAO (2012), RAT, Organic and VietGAP are most present standards in the Vietnam's vegetable market.

This study focuses on the applications of these three standards in vegetable production. They are all voluntary, meaning that farmers can choose to apply or not. Organic is a private protocol, while RAT and VietGAP are public ones since they are fully elaborated by public entities. Especially, VietGAP has received many supports from the public sector. It is considered to be a core measure of Vietnam's food safety policy. Farmers who develop VietGAP could benefit from State's subsidy, through City's or Provincial's aid programs[2]. For example, many cooperatives in Hanoi have received financial supports from the City of Hanoi for investments in VietGAP production. Farmers were also selected to have free technical trainings (Integrated Protection Management method), while some seeds and biological protection substances have been freely distributed to make households more sensitive to the issue. Despite the efforts, farmers don't seem having much incentives to apply standards. Certified vegetable surfaces have increased slowly (Pham and al., 2016). A marge of growth does still exist, but it is likely to be small. In this study, we carry out interviews at 13 communes in the suburb of Hanoi to understand the situation. We also explore farmer's costs of production to see if standard application raises additional costs that farmers are not able to support.

The article is organized as following. In the first section, we describe the general context of vegetable production in Hanoi, and the theoretical framework of the study. Attention are paid on role and implication of communal cooperatives, who are key applicants of standards. In the second section, we present the methodology and data. In the third section, we present main findings of the study. Finally, discussions and a conclusion are given in the last section.

I. Agricultural context and theoretical framework to understand vegetable production in Hanoi

I.1 Agricultural context of Hanoi

[2] Decision No.2083/QD-UBND to approve *"Production and distribution scheme of safe vegetables in Hanoi city in 2009 - 2015 period"*, adjusted and supplemented Decision No.5975/QD-UBND dated on December 26th, 2011

Hanoi is the capital of Vietnam. With about 7 million inhabitants, it is the second most populated administrative division of the country (after Ho Chi Minh City), and a big agglomeration of the South East Asia region. The city of Hanoi is not fully urbanized[3]. Agricultural land is accounting for 188 601 ha, equivalent to 56.4 % of the total surface (To and al. 2011). Urban population is around 4 million inhabitants and rural inhabitants count for more than 3 million (GSO, 2009). The later could have diversified agricultural activities: rice's culture, livestock growing, fruit and vegetable planting, etc… According to Sautier and al., (2012), the rice culture is dominant by far. Vegetables are cultivated only on 12 041 ha – so about 6.5% of agricultural land – and are principally located in suburban areas. Offering from 3 to 10 cycles per year, this surface gives equivalence to 29 000 ha of production in terms of rotating surfaces.

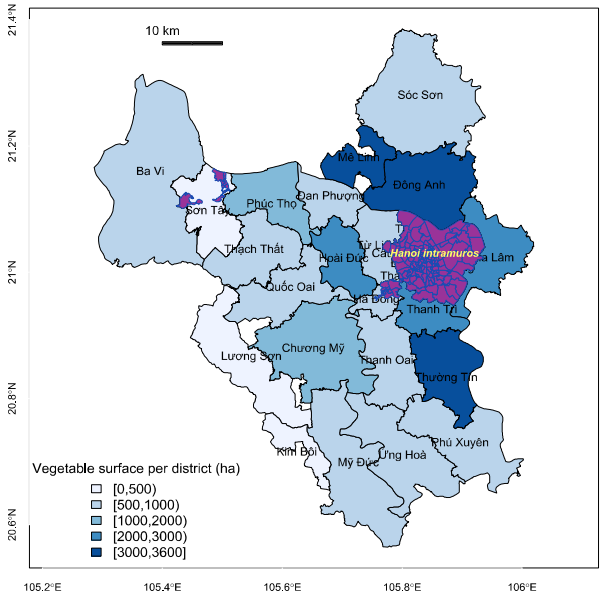


Figure 2 : Hanoi's total production surface of vegetable per district, period 2011-2013 Source: DARD of Hanoi (2015)

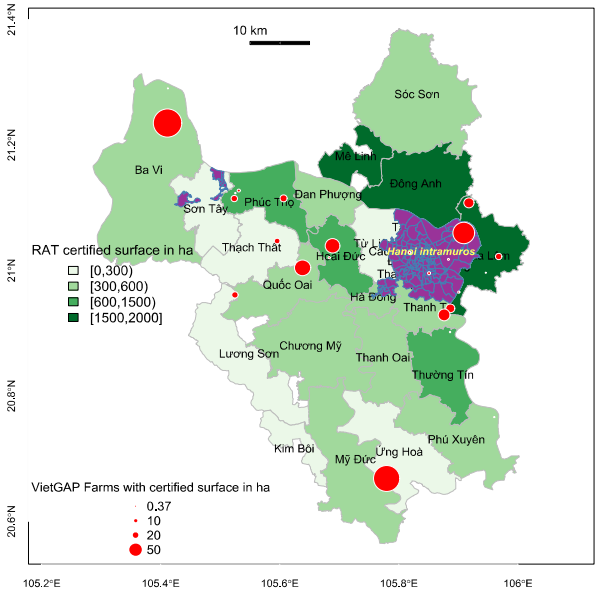


Figure 2 : Hanoi's total production surface of RAT per district period 2011-2013, with location of VietGAP farms in red. Source: DARD of Hanoi (2015)

Moustier and al., (2004) estimated that 50% of Hanoi's vegetables are produced under a 30 km radian from the city's center, which is called the Hanoi's green belt. The ratio goes up to 80% for leafy vegetables. Supply varies however upon seasons. Nguyen and Nguyen (2016) show from GSO statistics that 100% of Hanoi's consumption of vegetable are locally produced in winter ("locally" means here inside the administrative border of Hanoi), while this value is only 50% in summer.

Vegetable's cultivation is highly profitable for Hanoi's peri-urban farmers. Requiring much of labor than other agricultural activities, vegetables have shorter rotation time and could be developed on small pieces of land. The latter is important, because farmers in the Red river delta region (where Hanoi is center) possess only small cultivating surfaces. In average, a household in this zone works on 0.6 ha, comparing to 1.7 ha at national level (Wang and al., 2012). Vegetable is an important source of income as the Hanoi's demand for fresh vegetables is high. The City's daily demand is about 2600 tons (DARD of Hanoi, 2013). The Department

[3] Vietnam is administratively organized in Provinces and Cities under direct State's control. A city under State control, or literally City centrally directed, is an administrative perimeter equivalent to a province, that cover both rural and urban districts, In 2016, Vietnam has 5 cities of this kind (Hanoi, Ho Chi Minh City, Da Nang, Hai Phong, Can Tho) who are actually most populated and richest provinces of Vietnam.

of Agriculture and Rural Development (DARD) of Hanoi estimates that suburban areas can provide from 1560-3000 tons per day following seasons, which fit in general to 60% of Hanoi's total demand all the year; the remaining 40% come from other provinces. Distance is a matter, because vegetables degrade quickly under tropical climate (Moustier and al. 2004, Sautier and al., 2012). Vegetables are usually harvested at the end of the day, and delivered to wholesale markets very early in the morning (Sigrid and al, 2014), (Nguyen and Nguyen, 2016). Distanced producers must invest in logistics allowing transportation during the night, while closed producers can use simple transport means, such as individual motor. Wherever they are, vegetables must be available at retail (open) markets at the next day's morning. Benefiting from spatial advantage, vegetables cultivated in closed zones offer big income opportunity to farmers. To Thi Thu Ha (2008) estimates than they contribute to 83% of total income from crop production in peri-urban household. Some professionals says that vegetables generate 8-10 times more income than do rice on the same surface.

Ones don't need to read Von Thünen (1820) to see that such parameter suggests a maximum exploitation of agricultural land near the urban Hanoi. Spatial discrimination transforms districts closed to the urbanized Hanoi in specialized zones of vegetable production. These districts are: Me Linh, Dong Anh, Gia Lam, Thanh Tri, Hoai Duc (*Figure 1 and 2*). The two districts Soc Son and Thuong Tin are not direct neighbors of Hanoi intramurals, but are connected by highways. They also have important surfaces of vegetable. On the contrary, distanced districts are more orientated to rice production. Even though, vegetables production could be inserted between two rice seasons (from June to September) as an additional income opportunity.

Land is clearly a scare resource here. Agricultural lands tend to reduce drastically in favor of urban planning. In 2008, Hanoi has been merged to Ha Tay (previously a rural province). The current Hanoi has doubled its surface. Agriculture has been significantly shifted to these new "acquired" areas, letting urban developed on the ground of the "old city". Sautier and al., (2012) reported a decrease of 10 000 ha of agricultural land in the Hanoi's old perimeter: from 34 177 ha in 2010 to 24 152 ha projected in 2020, about 29.3%. The shift correlated "paradoxically" with an intensification of agriculture on the green belt zone. Peri-urban farms are more concentrating on productions with high value-added (Pulliat, 2015): livestock heads have increased in this zone by +35%, and porcine production by +13% between 2000 and 2007. Vegetable production follows the trend: that implies massive uses of fertilizers and of pesticide to boost yields and to protect harvestings. Income seeking, "the invisible hand" of Adam Smith, is at the heart of this evolution.

I.2 Theoretical framework

Institutional economists like Hamilton (1919), Mitchell (1910), and Commons (1934) argue that institutions constitute the framework for market economies, and sharp behavior of economic agents. Mitchell (1910) wrote: "*…the social concepts attain a certain prescriptive authority over the individual. The daily use by all members of a social group unremittingly molds those individuals into common patterns without their knowledge, and occasionally interposes definite obstacles in the path of men who wish to act in original way…"* (Hodgson, 2000). In the same way, John Commons (1934) said: *"individual with whom we are dealing is the institutionalized mind*". Karl Polanyi (1944) went further by putting forward the concept of

embeddedness according to which economic activities should be considered *embedded* in a socio-institutional environment. Then, later, North (1994) argues that this environment – which is historically formatted by generations – affects deeply economic performance. Institutions (and/or organization) establish routines, which is a factor of performance (Nelson and Winter, 1982). They also facilitate a process called *path dependence*: agent's decision are based on historical-institutional variables, which are stabilizing factors that help to deal with uncertainty. The literature on the issue is rich. Using this theoretical explanation, we try to shed a light on the institutional environment of Hanoi's farmers. Hanoi's households are very attached to the social structure where they come from, as showed hereafter.

Like in other Vietnamese administrative divisions, the agriculture of Hanoi is strongly controlled by deconcentrating services of the State. The powerful "*People's committees*" are organized in all 58 provinces and 5 cities under State's direct along the country. The people's committee of Hanoi city is competent for all agricultural activities inside its geographical perimeter. The responsibility belongs concretely to its DARD. Hanoi is divided into districts, then in communes (wards for urban communes). Each district has a chamber of agriculture, which is a DARD's antenna. At the communal level, the DARD doesn't have necessarily antenna, but could allocate 1 staff to assure connection between farmers and the administration. As a legacy of the centrally planned economy, each communes have one or some agricultural cooperatives who are responsible for agricultural production planning[4]. A cooperative, or more precisely *communal cooperative* in Vietnamese, is a supporting structure for agriculture. It is not a DARD's sublevel entity. However, cooperative's work is strongly connected to the administration. We pay attention on this point, because it is a key factor to understand the institutional environment of Vietnam's agriculture. From now, the term of *cooperative* is used when talking about "*communal cooperative*", and the prefix "*communal*" is added only when necessary.

Agricultural cooperatives were created in Vietnam in the middle of the 1950s, in line with the national agrarian reform implemented by the communist party at the same period[5]. The reform implied the nationalization of land, and the end of private farming. Cooperatives had been conceived as the most basic unit of production of the centralized administrative economy. More

[4] The number of cooperatives depends on number of "Thon" inside a Commune. "Thon" is an historical administrative unit of population that Vietnam had in the past. Today, it is no longer an official division, but an auto-managed community of inhabitants inside a Commune, and is recognized by the State. The definition of Thon is given by the Ministry of Home Affaires on this webpage: http://isos.gov.vn/Thongtinchitiet/tabid/84/ArticleId/588/language/vi-VN/M-t-s-di-m-m-i-v-t-ch-c-va-ho-t-d-ng-c-a-thon-t-dan-ph.aspx.

[5] Cox and Le (2014) divided the history of Vietnamese cooperatives into four main periods. From 1950s to 1975, it was the voluntary collectivization period. In this period, cooperatives had been progressively integrating in the State's planning operations. They managed land-uses, production inputs, and assured the distribution of production's outputs. With the time, they were controlling almost all of national productive wealth. The second period is from 1975 to 1981 where collectivization is compulsory, especially in the South of Vietnam after the war. Cooperatives are powerful economic structures, despite of their ironically weak productive capacities. During the third period from 1981-1997, Vietnam started to engage the process of decollectivisation. Farmers could make their own decisions of production for the first time. The 1986 marked the country's official step to a market-orientated economy model. From this date, farm households was replacing progressively cooperatives to become most basic units of agricultural production. At 1997, the decollectivization is considered to be achieved, then comes the last period called by the authors "*neo-collectivization*". Instead of being disappeared, cooperatives are transformed into shared-capital entities, which provide co-operating services for farmers such as irrigation, input supply or product's distribution under the market mechanism.

than an economic structure, a cooperative was a miniature society, being organized under social rules and managed by elected board's members[6]. Today, they are regulated by the Cooperative Law 2012[7], and are voluntary mutualist structures, who provide mutual co-operating services to members. A cooperative is a legal person who works "*on the basis of selfcontrol, self-responsibility, equality and democracy in management of cooperative*" (Article 3, Cooperative Law 2012). A Vietnamese cooperative is necessarily different from a company from a legal standpoint, since their object is not to make profit. In the current juridical framework, not the cooperative but the household is the basic unit of decision. Households are free to choose activities that fit their interests at best (ex: high-income cultures or livestock). They are also free to participate to a (communal) cooperative or to create a voluntary cooperating group among themselves. But the shadow of history is always present.

In reality, farmer's degree of freedom are much more limited than announced by the law. They have been strongly depending on (communal) cooperatives, because the latter assure for them access to technical supports, to technological transfers, to subsidy, and to the market. Moreover, cooperatives continues to assure the important connection between farmers and public authorities. Old routines are strong. Theoretically, a cooperative is not a part of the administration, but the managing board are usually members of the communal People's committee. Public funding pass also through cooperatives, instead of being directly distributed to farmers. The new cooperative law has transformed cooperatives into share-capital structures, but has not modified their administrative embedment. Voluntary cooperating structures (targeted by the cooperative law) are not frequent in Vietnam, because private shares tend to adopt a company form. The next sections show how these institutional variables affect standard applications.

II. Methodology

In this study, we mobilize three lists of applicants (certified producers) in Hanoi: the RAT list, the VietGAP list, and the Organic list. The RAT list is an inventory of 125 vegetable producers who have the Certificate of Safe production capacity. Unable to reach the most updated list of the DARD of Hanoi, we use the list of 2013. The RAT certificate is valid for a period of 3 years, meaning that 2013-applicants are still complying the standard in 2016, (the year of our study). The VietGAP list is given from the public website: www.vietgap.com.vn. We use the 2016 publication, which contains producers who have been certified from 2014 to 2016. The VietGAP certificate is valid for 2 years. In total, we have only 24 producers from Hanoi in this list. Concerning the Organic list, we don't have information on the cooperative. Organic producers are organized in voluntary groups (or teams). This organization allow to implement PGS cross-control method among groups/teams. All of them are put under the responsibility of Thanh Xuan intergroup. The table 1 gives a short description of categories of applicant.

	RAT	**VietGAP**	**Organic**
Cooperative	113 (29.74 ha / 26.76)	15 (15.4 ha /12.3)	0
Company	9 (6.12ha / 6.96)	7 (2.2 ha)	0
Farmer's group	3 (7ha / 2.65)	2 (0.8 ha/ 0.1)	14 (0.85 ha /1.37)

[6] See Axel Wolz for more details: http://www.sai.uni-heidelberg.de/intwep/fia/DISKUS72.htm
[7] Cooperative Law 23/2012/QH13, voted by the Vietnam Parliament on November 20, 2012

Total surface in Hanoi	**3828 ha**	**309 ha**	**17.87 ha**

Table 1 : Effective number of Hanoi's certified producers - surface mean and standard deviation in the bracket.

The total RAT certified surfaces in 2013 are 3828 ha, representing 45% of the total vegetable surface of Hanoi. Among the 125 RAT producers, there're 113 (communal) cooperatives, 9 companies and only 3 voluntary farmer's groups. Concerning the VietGAP, certified surface is much smaller than RAT's one. Accounted at 309 ha, it represents about only 2.8% of Hanoi's vegetable surface. VietGAP producers are 15 communal cooperatives, 7 companies and 2 farmer's groups. Concerning organic production, no cooperative is officially involved, but 14 farmer's groups.

Data show that cooperatives are by far the dominant actor, both in terms of effective number and surfaces of production[8]. Besides, interviews with companies show that they are heterogeneous. Among the 7 companies producing VietGAP, 5 are trading companies with modest parts of vegetable own production. Certified vegetables are bought from other cooperatives (not all from Hanoi) to optimize the production cost. For companies who produce 100% of their vegetables, the production is considered as a loss leader to sell other products[9]. Then, we decide to focus only on cooperatives, with an extension on farmer's groups concerning organic production. Studied cooperatives are selected from all vegetables specialized districts around Hanoi, in the way that is most representative to their surface of production: big surface districts provides more cooperatives than small surface ones.

We use two questionnaires to collect data. The first one is reserved to the cooperative's managing board, or farmer's intergroup managing board. The objective is to understand the organization and the role of cooperative/intergroup in applying standards. The second questionnaire is destinated to farmers in the same cooperative, at the household level. Questions are put on the history of the household, the way that they apply a standard, and on details of their costs of production. We focus only on real expenditures, f.g what farmers have effectively spent for the production. The method is based on an accounting approach, rather than an economic one[10]. By consequence, some economic cost such as the labor cost, or eventually subsidy deduction are not integrated in our calculus. Anyway, we always ask interviewees about them, to make sur that these factors are under control.

III. Main findings

III.1 Cooperatives implications

In total, we study 12 cooperatives, 1 farmer's intergroup and 20 household's farmers. All of the cooperatives (integroup) are developing, or at least have been developing RAT standard. 7 of them possess the VietGAP certificate. The farmer's intergroup is in the commune of Thanh Xuan who develops organic standard.

Number of cooperatives/intergroup in survey	13
Cooperatives with VietGAP	7

[8] The total surface exploited by company is 48.6 ha of VietGAP (16% of Hanoi vietGAp surface) and less than 2% of RAT surface

[9] Because of secrecy commitment, we are not allowed to reveal company's identification here.

[10] See (Mankiw, 2012) for details.

Cooperatives with RAT	11
Farmer's intergroup with Organic	1
Average number of agricultural households per cooperative	1368 (669)
Number of share-holder members	811 (621)
Annual member fee per *sao* (360m2)	2.91 $ (2.21$)

Table 2 : Characteristics of interviewed cooperatives in the survey. Standard deviation are in brackets

These 12 cooperatives are all communal cooperatives. Some of them have just finished the conversion process in the new model defined by the 2012 Cooperative Law (the voluntary share-capital model), some others are on-going process. In both cases, they are continuing to support collective basic services for all farmers inside the perimeter, independently whether farmers are members of the new structure or not. The average household number per cooperative is 1368. Historically, the services have taken part of cooperative's mission. They are irrigation (access to water, pump station, drainage), controls of production (crop protection, and control again stoles) and control for safety (new service consisting on control against uses of illegal pesticides). Member fees are fixed per *sao*, which is a local unit of agricultural land: the more surface exploited, the more farmers pay for service. One *sao* is equivalent to 360 m^2 of cultivating land. At 2.9 USD/*sao* per year, the amount is quite modest regarding to other production costs. We insist on the fact that cooperatives assure an equal access to all farmers, share-holder members or not. Some of cooperatives even distribute water and electricity freely to all. At only 20 km from Hanoi's center where trade is the most common rule for everyone, it is hard to believe that farmers could have free water and electricity for their production.

All of our 13 studied cooperatives/intergroup are implied on standard application, but their implication are gradual upon standards. RAT is the most influenced case. The implementation of RAT is fully integrated into the Hanoi scheme of safe vegetable development to 2015, which is piloted by the DARD of Hanoi. It is totally driven by cooperatives, and not by farmers at household level. In fact, the DARD is in charge of defining safe areas for production, following to soil and irrigation water conditions submitted by cooperatives. Then, the DARD supports training of farmers (IPM method), and delivers the Certificate of safe condition. The cooperatives act as an extended service of public authorities. Farmers don't have possibility to choose. The key condition is to have a piece of land inside the delimited certificated area.

VietGAP application is also highly influenced by cooperative's implication. Among 7 VietGAP certified cooperatives, 6 received funding from the DARD for this purpose. Public funding covers the delimitation of VietGAP areas, the creation of semi-transformation houses (new construction or adaption of existing building as required by the VietGAP protocol), and the certification cost. Some cooperative managers don't even know what the price of the certification procedure was, because they didn't pay with their own money. Funding for certification is integrated inside a subsidy package that they receive as a whole[11]. Some others obtain the VietGAP certificate without having effectively produced. A cooperative manager reveals that he hasn't delivered any guarantee for buyers, because they are "*not ready to produce under standard*". But he proudly showed the certificate document on demand.

[11] According to interviewees, public subsidies aims to fund infrastructure building generally, for example: access road, irrigation system, semi-transformation houses. They are not specifically granted for VietGAP production.

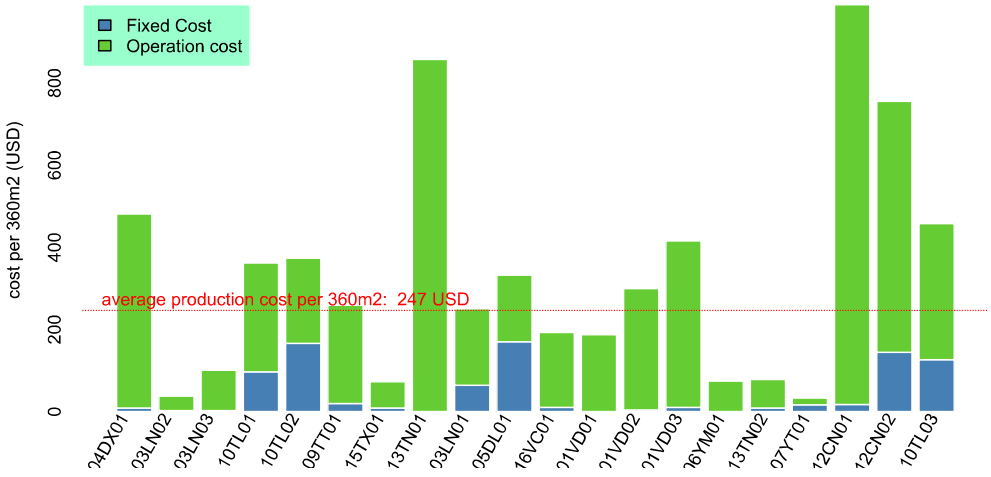
This finding is in some extent divergent to what reported by Moustier and Nguyen (2014) following that certification procedure is a financial obstacle for VietGAP development. We argue that certification cost is a potential, but not a real obstacle at present. Hanoi's farmers haven't really engaged in VietGAP certification yet: they follow simply cooperative's plans rather than apply standard by their own strategy. The 7th cooperative who was not financed by the DARD merits to be mentioned. This cooperative was financially supported by Syngenta Foundation at the beginning of VietGAP. This is an exceptional case because farmers have real motivation to develop VietGAP. To obtain exploitation right on VietGAP certified land, they must win a bid process. Rights are then allocated to those who have highest wiliness-to-pay. Certification cost is also covered by a third party. But in this case, farmers follow obviously instructions of the Syngenta foundation.

Finally, organic production seems to be the less influenced model by cooperative's instruction. This result shall be taken with precaution. Thanks to ADDA's project, farmers work in groups of 5-7 households. The Thanh Xuan intergroup is organized as a professional structure. They control the work of applicants, and examine new candidate's demand in regard to the collective interest. During the interview the Thanh Xuan intergroup manager mention the role of the cooperative several times without going into the details. Then, we are not certain that the communal cooperative has been neutral in the development of organic model. Deep analysis is needed in this case. For instance, we suppose that the role of the cooperative is rather weak.

III.2 Cost structure analysis

Analysis at the household level confirms that RAT and VietGAP applications don't really come from farmer's initiatives. Many interviewees have confusion between standard and agricultural practices. For example, they consider themselves to be VietGAP producers, because they respect technical requirements of the VietGAP protocol. However, they don't keep updated the field diary, an important element to assure traceability of VietGAP products. Some others worked in VietGAP certified land in the past, and think that they continue to produce under VietGAP today, because they use always the same practices obtained from training.

Data analysis on 20 farmer's shows that operating costs play overwhelming role in vegetable production (graphic 1). They represent from 40% to 100% in the study. The result is not surprising as producing vegetable requires simple conditions: a piece of land, seeds, water and of course labor.



Graphic 1 : Cost structure of 20 vegetables household producers in studied cooperatives

The typical model of vegetable production in Hanoi involves 1 to 2 unit of labor, who work on 4-5 *sao* of vegetable land (legal surface historically given for a household, about 1400-1800 m^2). These households could have accessory activities such as rice production, fruitier planting, or pork & chicken growing. But their main income is generated by vegetables. According to our calculus, production cost per *sao* is 247 USD/year, all standards taken together

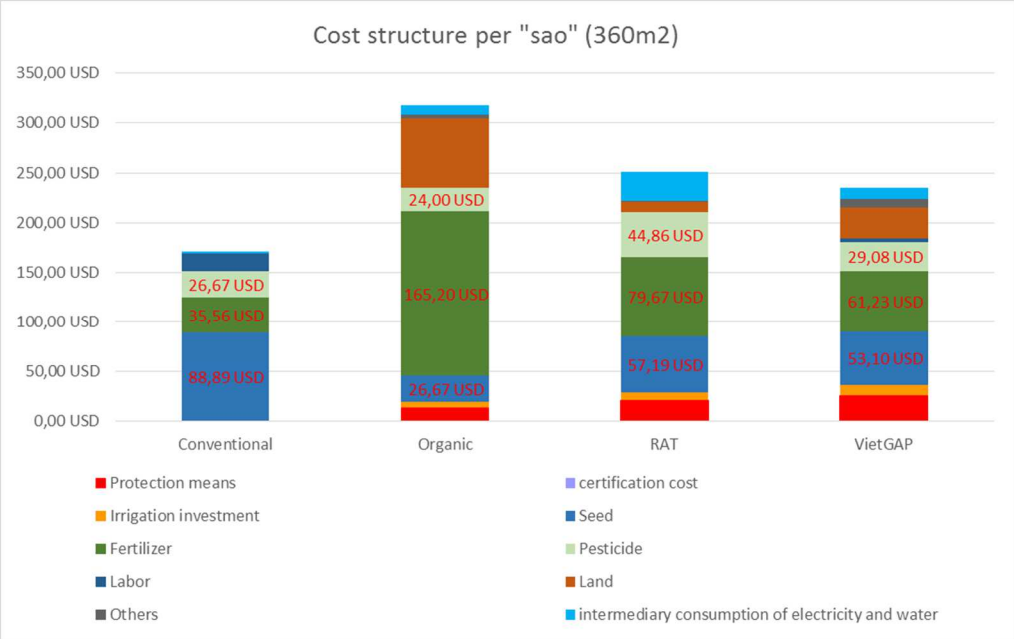
	Mean	S.deviation
Vegetable surface	0.171 ha	0.102 ha
Vegetable surface in sao (360 m2)	*4.75 sao*	*2.83 sao*
Annual Work Unit (AWU)	1.77	0.75
Age of principal farmer	56 y.o	5 y.o
Fixed cost in USD	154.55 $/y	269.58 $/y
Operating cost in USD	951.9 $/y	676.5 $/y
Total cost of production in USD	1106.47 $/y	859.71 $/y
Average cost per sao (360m2) in USD	*246.5 $/sao/y*	*122.7 $/sao/y*

Table 3 : Result of 2016 survey. Exchange rate USD / VND at the moment of survey: 22 500

We wanted to verify if standard application generates additional cost for farmers comparing to a conventional model, costs who are financial obstacles. We haven't obtained satisfied answers to this question. Concerning RAT and VietGAP, interviews show that there's some little difference in cost, between standard and conventional vegetables.

VietGAP requires two significant "investments", that are the semi-transformation house and the certification. Our study show that these two expenditures are wholly subsided by sponsors until now. They are not at the charges of farmers. The amounts don't appear too high no more for financial capacity of a cooperative. Difference come principally from household's individual investments, which increase their fixed cost. They concern irrigation and harvest protection. In fact, RAT and VietGAP protocols require that irrigation water respect legal safe thresholds. In case that water sources are not safe, farmers have choice to pump water from the phreatic nappe. The irrigation cost corresponds to the creation of drilling well, and pump machine to access to safe water. About protection means, they concern installations of net house (which help to protect vegetables from insects and bad weather), and uses of plastic tarp on ground to avoid adventice; these methods are not directly required by standard protocols, but they are often chosen by standard applicants to protect their harvest. Both irrigation and

protection means are investment for years. We use a depreciation rate to calculate the yearly fixed cost[12].



Graphic 2 : Cost structure per category of producer

The graphic 2 shows cost structure per *sao* of 4 categories: three groups of standard farmer, and a group of conventional farmer. Please note that the categories are not exclusive (except for Organic): farmers in a "standard group" could also have conventional production, because only some of their parcels are certified. But, interviews show that they have same practices on all of their parcels. It means that if a farmer produces under VietGAP (or RAT), he does exactly the same things on VietGAP (or RAT) parcel than on conventional parcels. This information is constant in all of our interviews. No farmer said making discrimination between standard and conventional production. For this reason, we consider that observations are enough homogenous to make group.

Following to the graphic 2, Organic is the group that generates the highest production cost. A *sao* of organic vegetable costs in average 318 USD /year, again 250 USD/year for RAT, 235 USD/year for VietGAP, and 171 USD/year for conventional. The production cost of RAT and VietGAP are higher than that of conventional, because of fixed cost (as explained in the above paragraph). But it is paradoxical to see that despite of these investments in favor of biological methods, the cost of fertilizer and pesticides are still significant.

	Conventional	Organic	RAT	VietGAP
Seed	51,8%	8,4%	22,8%	22,6%
Fertilizer	20,7%	51,9%	31,8%	26,0%
Plant Protection substances	15,6%	7,5%	17,9%	12,4%
Aggregated weight in total cost	88,1%	67,9%	72,5%	61,0%

[12] Depreciation rates are fixed in function of estimated time of use for each material. From interviews, we determine a "reasonable time of use", which is the time experimented by most of interviewed farmers.

Table 4 : Weight of main production inputs per category of producers

The table 4 shows weight of three main inputs of vegetable production: seed, fertilizer and pesticides. The aggregated weight of the 3 inputs are 88% in conventional production, 72% and 61% in RAT and VietGAP, 68% in Organic. Then, all the three standards use more of fertilizer than the conventional production (in economic value). Especially, organic production is highly depending on use of animal's effluence, since the organic protocol doesn't allow synthetic fertilizers. This finding show the importance of yield for vegetable's producers in Hanoi.

Another result is that farmers in 11 of our 12 studied cooperatives say having problem of standard recognition. It means that they have to sell standard vegetables as conventional vegetables, because the market is not able to recognize standard product and doesn't assign added-value to them. This problem is rather complex to be presented here. But it explains at least why farmers prefers pay for operational cost rather than investment. With no guarantee on added-value, one should avoid investment and choose flexibility. Despite this difficulty, vegetables continue to be an important earning for farmers. The Hanoi's demand is high. Vegetables can be flowed out easily by collectors, or by direct sales at wholesale markets. Maintaining high yield is primordial, and fertilizers and pesticides are efficient arms to reach this objective.

IV. Discussion and Conclusion

Our study shows that RAT and VietGAP standard's development are strongly depending on orientation of communal cooperatives. The case of organic is a bit delicate, because the weak scale of organic production doesn't allow us to look generally on cooperative's role. But it's show clearly that Vietnam's agriculture is embedded in a specific socio-institutional environment. This environment is firstly created by historical context: the legacy of the soviet socialism. Cooperatives controlled factors of production (in particular land), and the distribution of wealth in the past. Today, they continue to control access to land, water, and electricity, which are inputs of vegetable production. By consequent, standard application is also affected directly or indirectly by cooperative's instructions.

But more than a question of access, cooperatives are at the heart of the *Path dependence* mechanism. They link farmers and administration through a set of old working rules, which have not been modified after the new 2012 cooperative law. The mechanism works on both sides. On one side, farmers follow cooperative's plan because they cannot participate individually into the market's game. Having nor capital neither knowledge, they follow the cooperative as it helps at least facing uncertainty. Let's precise that most of Vietnamese farmers don't have a legal personality. They count on cooperatives to have protection in transaction (for example to sign contract with buying companies or collective restaurants). On the other side, the administration consider cooperative as an extended service of public sector. Public policies are sent to cooperative's managing board who are responsible to deploy them toward farmers. Public funding transits also through cooperatives to be distributed to farmers. The path dependence is still very powerful.

Besides, vegetable production in Hanoi is also pulled by economic incentive. Yield seeking is important because it is synonym to income for farmers. Hanoi's demand for vegetable is high while consumer prefer freshness. Even though productions under standard don't create necessarily added value (problem of standard valuation mentioned above), producing vegetable is much higher profitable that rice. Our study estimates that income generated by vegetables is

741 USD/ sao /year[13] (all kind of standard are mixed). For a household who works on 4.7 *sao*, our estimate gives equivalent to 290 USD/month, which is a very interesting crop production income. Our result is compatible with statistics from the DARD of Hanoi in 2013. The DARD of Hanoi report an average income for vegetable producer at 400-500 million VND/ha/year; with some specific regions at 700-800 million VND/ha/year. In USD, these incomes are about 640-1280 USD/sao/ year. Our result is also compatible with that of Pham and al. (2013) who reported a value of 1200 K VND/month for 1000m^2 of vegetable production in the Red river Delta. A gross conversion of the latter gives 640 USD per year per 1000m^2 of profit. The convergence of all estimates show firmly the economic interest of vegetable production.

A questionable point should be put on labor accounting. We choose to work on real expenditure, and don't account labor cost. One can argue that difficulty in standard application could be link to required supplement labor. Moustier et al. (2004) estimated for example that the labor cost of RAT is 40% more than conventional for RAT, and that of organic 60%. Of course, labor is important and we tried to control this factor. But farmer's answers on the issue are very inconsistent. Some say that they had to put more labor, some other the same. The adoption of standard was finished long time ago, from 2000-2005 for RAT, from 2008-2010 for VietGAP. Then, we cannot assert credibility to these answers. We also think that supplement labor if any, has become endogenous from this time. Whereas, farmers say that they use the same practices on both certified and non-certified lands. That's why we are not able to calculate gap of labor cost.

Conclusion

In this article, we study the applications of 3 standards RAT, VietGAP, Organic on vegetable production in the suburb of Hanoi. We carry out interviews with managers of 13 cooperatives / farmer's intergroup, then with 20 households in order to understand how they apply standards. The results show strong implications of cooperatives on RAT and VietGAP application. Concerning the organic production, this model shows particularly the role of the farmer's intergroup without discrediting the role of cooperative. At the household level, our study shows that farmers don't really apply standards by themselves, except organic producers. Producing under standard generates several additional fixed costs, but we are not certain that these costs constitute financial obstacles for households. On the contrary, we found household's important expenditures on fertilizers and pesticides.

In the Great Transformation (1944) Polanyi described the two economic logics that frame occidental economies. The first one is the liberalism, which calls for a deregulation of institutional system in favor of the market economy. The second one, opposite, is the embeddedness of economy inside a protecting institutionalization process (Maucourant and Plocinicczak, 2011). The logic of embeddedness aims to protect fundamental productive forces of a society: land, labor, money. These factors were not merchandises initially (they had not been produced to be sold on a market) but become merchandises under the force of the market economy. Polanyi showed in particular that today market economies correspond to a "*dis-embeddedness*" of economy from the institutional system (Vančura, M. 2011). From this point of view, the applications of standard in vegetable production in Hanoi provides an interesting

[13] We put this value in the discussion section, because we don't have enough control on it. In fact, some farmer talk about net income (after charge deduction) while some others talk about the amount of money they receive after each cycle of vegetables.

observation. We are at a turning point, where activities of production have been fully embedded in the social-institutional frame composed by cooperatives and the administration. But the dis-embeddedness is starting to happen, under opportunities of income and consumer's demand for safe foods. According to Polanyi, once the market can impose its own rules, it can make autoregulation among supply - demand. But when will the dis-embeddedness of Hanoi's agriculture happen? Is this for a good or a bad thing? When could Vietnamese consumers have large access to safe vegetables on the market? We believe that answers depend largely on the evolution of Vietnamese cooperatives in the next future.

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