

Good Agricultural Practice (GAP) as a vehicle for transformation to sustainable citrus production in the Mekong Delta of Vietnam

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Abstract: *Pressure from the emerging Vietnamese middle class for access to “safe food” has prompted changes in the traditional food supply chain from: individual farmer → middle man → traditional markets (formal, informal and hawkers) to: farmers organised in cooperatives or less formal farmer groups → supermarkets. This process has gained significant government support resulting in the introduction of policies and support for “safe vegetable production” and recently the establishment of Vietnamese Good Agricultural Practice (VietGAP) standards. VietGAP is a government decree laying out the principles for sustainable and safe agricultural production supported by certification and auditing systems. These consumer driven market transformations together with government policies has increased the pressure on farmers to adopt more sustainable production practices. This paper examines GAP as a framework to secure food safety and sustainable production, and farmer field schools (FFSs) as a platform for GAP learning and establishment of GAP collective action and practices under specific Vietnamese smallholder conditions where the GAP process is strongly driven by government. Our results indicate that a participatory approach to GAP implementation resulted in successful joint government-private sector intervention in citrus production. It is, however, too early to draw conclusions about the sustainability of GAP certification since the economic benefits for the GAP certified farmers in comparison to non-certified farmers are not yet clear. Regardless of the sustainability of GAP certification, improvements in economic, social, human and environmental capital as a result of citrus FFSs conducted in the GAP implementation process will have long term positive effects on sustainable citrus production in the Mekong Delta.*

Keywords: *citrus, Vietnam, good agricultural practice, farmer field schools, participation, collective action*

Introduction

The rise of supermarkets is an important phenomenon with huge implication for farmers (MSM, 2008). They were established in the US in the 1930s and soon after in some European countries including England, France and Germany. They spread throughout Latin America in the 1980s (Reardon and Berdegue, 2002) and reached Asia in 1990s. The first Asian supermarkets were established in Malaysia and then they rapidly extend throughout the region including China, where the number of supermarkets increased 40% per year (Shepherd, 2005). In Vietnam the number of supermarkets increased dramatically between 1993 and 2004 with the increase in Ho Chi Minh City between 2000 and 2004 being 17% per year. This raise in supermarket number in Vietnam is a result of incentives from government that promote ideals of food safety and modernisation (Moustier *et al.*, 2006) and demand from the emerging Vietnamese middle class for quality and especially safety of food products (Figuie and Dao, 2004).

Results of our own survey of market agents conducted in 2008 at Hanoi Long Bien wholesale market, from where fruit and vegetables go to street and small suburban market vendors, show that food safety was put last as a criterion for selecting product below that of appearance, taste, origin of product and storage ability, indicating that food safety is still not the main concern of lower income consumers. Even though food safety, especially safety of vegetables, is one of the main attractions of supermarkets for wealthier Vietnamese consumers and a rising number of expats living in Vietnam,

the system of compliance is fragile and in Hanoi there has been no adequate system of vegetable quality assurance and field certification since 2002 (Moustier *et al.*, 2006).

Supermarkets insist that farmer associations and cooperatives take responsibility for safety assurance and take care of auditing for compliance with regulations for safe food production. Indeed most cooperatives and farmer associations that supply fresh fruit and vegetables to supermarkets practise quality control similarly to participatory guarantee systems developed by the international organic movement. It is based on commitment by farmers to follow production protocols and procedures. Compliance is occasionally checked by random inspections, followed by warnings and sanctions. However, the major thrust for compliance comes from the farmers themselves, who regularly check on one another (Vu and Le, 2006; Moustier *et al.*, 2006). A cross check conducted by our research team during visits to several cooperatives that produce “safe vegetables” on the outskirts of Hanoi and Hue showed that not one of them had sufficiently detailed written records of fertilisers and pesticides used to show the time of application and dose applied.

Food safety has been a major concern for Vietnamese central and local governments and has led to the “Safe vegetable program” launched by the Department of Agriculture and Rural Development (DARD) of Hanoi and Ho Chi Minh City in the early 1990s (Moustier *et al.*, 2006). The program then extended to the most of provinces with the strong support from the Ministry of Agriculture and Rural Development (MARD). Finally on 28 January 2008, MARD issued decree No. 379/QD-BNN-KHCN that established VietGAP as the main standard and guidelines for production of safe fruit and vegetables. The aim of VietGAP is to prevent and minimise the risk of hazards which occur during production, harvesting and post-harvest handling of fruit and vegetables (VietGAP, 2008). A critical issue for the safe vegetable production program was lack of capacity for auditing and certification by Vietnamese authorities. For VietGAP MARD authorised a number of mainly private quality control assurance providers to issue certification for compliance with VietGAP and the full cost of the certification process is paid by the producers. This different approach to auditing and certification taken by MARD in administering VietGAP may lead to wider implementation of VietGAP on condition that producers who obtain certification can achieve a high enough increase in profitability to justify investment in VietGAP certification.

In this paper we will look at the potential of VietGAP to provide a framework for sustainable agro-production and catalyse transformation from production on individual small farms (usually smaller than 1 ha) to larger scale cooperative farming. We will particularly examine the use of Farmer Field Schools (FFSs) as a platform for GAP learning and establishment of GAP collective action and practices. Finally we will present two cases of citrus farmer groups that received GAP certification. These cases illustrate conditions in which GAP implementation may be successful.

GAP and specificity of implementation in Vietnam

GAP framework (GLOBALG.A.P. and VietGAP)

Good agricultural practice (g.a.p.) refers to the practices that farmers engage in to minimise the detrimental environmental impacts of farming operations; reduce the use of chemical inputs; and ensure a responsible approach to worker health and safety, as well as ensure animal welfare. **Good Agricultural Practice** when capitalized refers to an official certification process used to ensure that good agricultural practices including prevention or reduction of the risk of hazards occurring during production, harvesting and post-harvest handling of produce. In essence G.A.P. is a certification scheme for the verification of g.a.p. use.

GLOBALG.A.P. is the most widely used g.a.p. standard and certification scheme with 89 accredited certification bodies implemented in 80 countries worldwide. GLOBALG.A.P is the successor of EurepGAP with the name change introduced on the 7th of September 2007 to reflect the global adoption of the scheme. EurepGAP was formed in the mid 90’s by retailers that shared the vision of an organisation that could develop harmonised standards for agricultural production rather than

develop many individual retailer production requirements. Today GLOBALG.A.P. is governed by retailers and producers (Garbutt, 2005).

This change in governance from retailers only to joint retailers-producers reflects accomplished partnerships between retailers and producers in the implementation of efficient certification standards and procedures. It should be noted that in Europe governments have not been part of the g.a.p. implementation and certification process but the process was driven by retailers and then embraced by producers and both actors achieved benefits that are not just economic, through the higher price of certified products, but also include a significant reduction of liability risks and effective compliance with government environmental and worker safety regulations. However in Vietnam the government is the main driver in the introduction of VietGAP and government institutes with assistance from donor organizations and foreign experts are the main actors in development, implementation and certification of VietGAP. Even though there is good reason for the high level of government involvement, namely a weak retail sector and a lack of large producers, the fact that major actors (producers and retailers) who are supposed to voluntarily use VietGAP have not been a significant part of the VietGAP development process may result in a very limited level of VietGAP implementation and consequently marginal impact on sustainable production of safe food.

VietGAP was developed based on GLOBALG.A.P. with slightly lower criteria for compliance in the areas of worker protection and environmental issues but not in areas that directly affect food safety including compliance with pesticide and fertiliser use or microbiological contamination. VietGAP provides standards for: a) Site assessment and selection, b) Planting material, c) Soil and substrate management, d) Fertilisers and soil additives, e) Water and irrigation, f) Crop protection and use of chemicals, g) Harvesting and post harvest handling, h) Waste management and treatment, i) Worker health and welfare, and j) Record keeping, traceability and recall (VietGAP, 2008).

Even though GAP certification may have only a minor impact on raising food safety for Vietnamese consumers, particularly in the short term, the GAP concept has great support from donors. Dr Bernd Eisenblatter from GTZ stated that EurepGAP is valuable in developing public private partnerships for development of sustainable supply chains between the developed and the developing world and for raising social standards in agriculture (In:EUROPGAP Global Report 2005 see reference for Garbutt, 2005). The Australian Assistance in Development organisation (AusAID) funded at least four projects over the last 5 years as part of the Collaboration for Agriculture and Rural Development Program (CARD) that have focused on GAP implementation in a variety of crops including leafy vegetables, tomatoes, cucumbers, dragon fruit and citrus.

Compliance of the Vietnamese citrus industry with GAP standards and feasibility of GAP implementation

A survey was conducted in 13 provinces at the beginning of the project to establish the status of existing citrus producers in relation to GLOBALG.A.P. requirements and to assess feasibility of GLOBALG.A.P. implementation in the citrus industry. GLOBALG.A.P. requirements were chosen because at the time of the survey (2007) VietGAP was not yet developed. Those surveyed included five randomly selected farmers from one village in each province (total of 65 farmers). Even though sample size was only 2.5% of the total number of the farmers involved in the project, very similar production methods throughout the province reduce variation between surveyed farmers, allowing the survey to provide a reasonably representative picture of the level of compliance with GLOBALG.A.P. requirements.

Survey showed that the average size of citrus orchards in the Mekong Delta is around 0.5 ha and in the Northern parts of Vietnam around 1 ha. However, revenues from citrus in the Mekong Delta are higher due to higher market prices, so income per household does not differ greatly throughout Vietnam. There is a high degree of specialisation in the varieties of citrus grown within provinces in Vietnam, with farmers in Dong Thap province almost exclusively growing mandarins and farmers in Nhge An province almost exclusively growing oranges. Pomelo is grown in a majority of provinces and the area planted has increased in the last decade. Different varieties of citrus provide very

different returns to farmers. While the net profit per year averaged over citrus species and provinces was VND 78,620,000/ha (1 € = 22,000 VND), farmers growing mandarins had the highest average net return of VND 100,000,000/ha followed by pomelo growers with VND 93,330,000/ha, in contrast with orange farmers who only had an average profit of VND 37,880,000. Not surprisingly, the highest profits of over 100,000,000 VND/ha were recorded in Tien Giang and Dong Thap provinces where mandarins are predominantly grown. Compared with rice the net return from citrus is 3 to 6 times higher.

Above results imply that individual farmers in provinces with most profitable production have an income of about 50,000,000 VND per family per year. The cost of certification for GLOBALG.A.P is about 30,000,000 VND per year and for VietGAP about 10,000,000 VND per year. However, farmer groups can get collective certification for not much higher cost as long as their properties are close to each other in the same area. The data also show that citrus production is profitable and farmers do have some financial capital they could invest in GAP implementation providing the certification secures higher returns on production and/or stable access to the premium market. These results imply that GAP implementation is possible through collective action of organised farmers, either in cooperatives or less formal farmer groups. Another possibility would be if initiatives for GAP implementation and certification would come from retailers (supermarkets) that would enter into a long term contractual relationship with farmers and provide farmers with initial capital to make the necessary adjustments for GAP compliance on their farms.

There were no producers in any of 13 provinces that complied with GLOBALG.A.P. requirements and who could be awarded certification with minimum adjustments. Results show non compliance to be highest for site history, post-harvest and product traceability. Individual farmers cannot make changes to comply with requirements in these categories because a complete change in the production and distribution chain is necessary. In Vietnam there is virtually no post-harvest management of citrus fruit such as washing, waxing and packaging. Fruit are collected from the farmers by 'middle men' or in some cases the farmers sell directly to consumers at the farm or a nearby market. Some cooperatives in the Mekong delta have their own shops where fruit are categorised and branded with labels, but the amount of fruit sold that way is negligible. The requirement for use of certified nursery material is very difficult to meet on the larger scale because the production of certified nursery material is far below demand.

From the survey results in the Mekong Delta only 17% of planting material came from certified nurseries even though 70% of interviewed farmers have a positive attitude towards nursery planting material but could not buy it. Compliance with pesticide and fertiliser use requirements in most cases can be met with reasonably small adjustments of current practices. Farmers are aware of the need to use registered products and to comply with the withholding period. However farmers and extension officers do not have a full understanding of the GAP requirement for a registered product. The GAP requirement for a registered pesticide is that the pesticide is specifically registered for the targeted crop (citrus in our case), while PPD staff described a registered product as a pesticide registered for any crop in Vietnam that has not been placed on the list of banned pesticides. Consequently if no specific pre-harvest interval was set for citrus (because the product was not registered for citrus) then no compliance with this requirement is possible. It is a generally belief of Vietnamese farmers that a 14 day pre-harvest withholding period is acceptable for any pesticide. Compliance with the pre-harvest interval requirement is also very difficult in the Mekong delta because of the practice of continuous harvesting throughout the year. Compliance with the requirement for training in pesticide use is relatively high and compliance with the requirement for use of safety gear is partially met in most cases. However we found no appropriate record keeping and pesticide storage and disposal practices in any of surveyed provinces.

Overall the citrus industry in Vietnam is far from meeting GLOBALG.A.P. requirements. There are many infrastructural changes (eg. sewage system and construction of packaging warehouses) that need to be made before compliance with GLOBALG.A.P. could be possible. Also improvements in the pesticide registration system need to be made so that appropriate pesticides are registered for citrus.

Considering the realities of the citrus industry we had two options as to how to proceed with the project: a) concentrate all efforts in a very small area and get a very limited number of farmers to the level of compliance to be able to achieve certification or b) involve large numbers of farmers in a learning process using the GAP framework as the basis for curriculum development while trying to make improvements in practices in certain areas like plant protection to the level of compliance with GAP requirements. In our judgment the first approach would be unsustainable since most infrastructural adjustments would have to be made through project subsidies (i.e. building of storage facilities, field toilets etc) and impact would be limited to a very small number of farmers. It might be argued that a small group of compliant farmers could be used as a model for scaling up but we also find this unrealistic because of the lack of available capital for other farmers to follow the model and unclear market opportunities for certified fruit. So we decided to involve large number of farmers in a participatory approach to g.a.p. implementation. We used the field farmer schools (FFSs) model as a platform for experiential learning but we also hoped that FFSs would facilitate communication between actors involved including farmers, extension and technical personnel of government departments and non-government organisations, the private sector including input providers and supermarkets, researchers from institutes and universities, and local government officials to establish GAP collective action and practices.

Farmer Field Schools (FFSs) as a platform for GAP learning and establishment of GAP collective action and practices

In Vietnam, traditional approaches to farmer extension have been through programs that involve dissemination of information from experts to farmers in a uni-directional manner. Most if not all training effort by government or non-government extension services that train farmers in GAP or safe vegetable production have been organised in that way typically in a format of 2-3 day courses. Farmer Field Schools, however, are based on the principles of non-formal education involving multiple cycles of participatory, experiential learning with evaluation embedded in each cycle. Local knowledge is valued and researchers become learners while participants actively engage in research. Facilitation of the learning cycles that involve multiple stakeholders is seen as more important than the unilateral dissemination of expert knowledge, with learning expected to occur for all parties involved (O'Leary 2005).

Our main partners in Vietnam were the Plant Protection Department (PPD) of the Ministry of Agriculture and Rural Development and VACVina, the largest Vietnamese gardening association with more than 600,000 members. Scientists from the Southern Fruit Research Institute (SOFRI) in Tien Giang Province, Mekong Delta, developed the Manual for implementation of GAP in citrus using GLOBALG.A.P framework. The manual is valuable resource material for professionals who will be engaged as extension officers or consultants in GAP implementation but it is of no use for the farmers.

Even though nominally in the project document GAP implementation and development of resources for GAP was the main focus of the project, in fact the participatory learning and assessment of GAP framework and implementation methods provided the major value of the project. The learning process happened at two levels: professional agricultural practitioners' level (mainly employees of PPD) and farmers' level. Professionals became trainers and during the 3 year project 10 master trainers and 98 trainers in 13 provinces developed knowledge and competency in citrus IPM and GAP as well as in methods of participatory training and research with farmers. These trainers facilitated a total of 72 FFSs in their local regions funded by CARD and an additional 17 FFSs funded by provincial government. A total of 2700 citrus farmers participated in year-long FFS programs starting with the postharvest activities in the orchard at the beginning of the calendar year to the harvest at the end of the calendar year. At the farmer level learning and experimental activities focussed on integrated crop management including IPM, plant nutrition and pruning, which are all in agreement with GAP principles. Considerable effort was invested in development and implementation of on-farm record keeping systems as a precursor for implementation of GAP.

On-farm recording system comprise of a series of record keeping notebooks with each notebook for one of the requirements of GLOBALG.A.P. The notebooks have very large space between lines so that farmers can write large letters. First record keeping note book that were developed that according to our surveys they preferred. We conducted surveys on record keeping habits of citrus growers in Mekong delta at the beginning of the project and found out that only 24% of respondents kept records of the quantity of fertilisers and pesticides they purchased, 8% had records of observed pests and diseases and only 12% had records of quantity of fruit produced and breakdown of income per date of sale. Most farmers only know the total income of sale at the end of the season. A year after the on-farm recording system was introduced feedback was very positive. Most farmers stated that records improve their capacity to select appropriate pesticides and improved their ability to make decisions based on cost effectiveness. All farmers stated that they will continue record keeping and 85% stated that they are prepared to pay 3,000 to 15,000 VND to buy the record books.

Even though impact assessment of the project will not be completed until mid 2010, a good indication that FFS and project activities have been well accepted by farmers and other stakeholders is the fact that in 2007 local governments of various provinces financed 17 FFSs, in addition to the 24 CARD financed FFSs. FFS have functioned as a very adaptive communication vehicle that has delivered training content appropriate to the level of farmers' skills and knowledge that varied in different provinces and villages. All farmers were trained in Integrated Pest Management (IPM), record keeping, soil management and pruning but the level and complexity of the training was adapted for each FFSs. In some northern provinces FFSs were extended to two growing seasons to accommodate farmers' learning needs. Preliminary impact assessment one year after completion of the first FFSs based on semi-structured interview with 60 farmers shows that 47% of the total number of interviewed farmers reduced input costs, 38% increased yield, 17% increased quality of fruits, and 13% increased the sale price of their fruit. Major changes in practices recorded in interviews with farmers were visible in the increased use of compost and manure followed by a change in the number of pesticide sprays used (slight decrease) and a significant change from use of broad spectrum pesticides (primarily synthetic pyrethroids) to less disruptive pesticides like mineral spray oils and imidacloprid. Implementation of more sustainable practices resulted in an increased number of beneficial insects in orchards and an increased abundance of fish in canals. Participation in FFS raised confidence in the ability of participants to manage their citrus agroecosystem. It also improved relationships between farmers who participated in FFS and increased their influence in the community. It increased activities in growers' clubs and in few cases led to formation of several cooperatives. Attendance in the FFS assisted in transition of farm management knowledge from father to son (four cases) and daughter (one case) and from husband to wife (three cases).

Positive impacts on other stakeholders include increased capacity of extension officers to facilitate farmer participatory training, increased knowledge about citrus IPM and GAP, and enhanced participatory research skills for scientists involved. Probably the most important result is the establishment of strong linkages and understanding between researchers, trainers and farmers that have influenced research and extension efforts

Linkages in many cases also include the private sector (i.e. input providers and supermarkets) with Farmer Union and local government officials. In two cases these strong linkages resulted in GAP certifications: GLOBALG.A.P certification for My Hoa cooperative and VietGAP certification for a farmer group in Long Hau village.

Implementation of GAP in My Hoa cooperative and Long Hau village

Our first successful GAP implementation and certification was achieved in Vinh Long province. In that province a total of 12 FFSs were conducted of which nine were financed by AusAID and three by the provincial government. At these FFSs 350 farmers were trained of which 342 were male and 8 were female. As a result IPM is practiced on 140 ha out of a total area of 240 ha of pomelo in the province. One of these FFSs was conducted for 26 members of My Hoa cooperative in Binh Minh district. The total area of pomelo grown by these farmers is 22 ha. The cooperative secured financial support to

implement GLOBALG.A.P. from the supermarket chain Metro in 2007 and on 19 September 2008 they were granted GLOBALG.A.P. certification by SGS Vietnam. The total production of pomelo for the 12 month period from May 2007 to June 2008 was 970T. My Hoa Cooperative exported 120 T of pomelo mainly to the Netherlands, Metro bought 50 T and about 800 T was sold on the domestic market.

In an interview held with the cooperative's vice-director in February 2009 we were told that even though Metro provided substantial funds to be used for GLOBALG.A.P. certification the supermarket chain did not commit to buy fruit from the cooperative. Funds were used to hire consultants to provide additional one-to-one training and help farmers keep required records, to subsidise costs of building infrastructure necessary for compliance with GAP including pesticide storage facility and field toilets and the remainder of the funds were used for the certification process itself. According to the interviewed vice-director and few farmer-members of My Hoa cooperative after certification process was completed and the consultants' support terminated, farmers have problems with record keeping on their own, and cooperative and farmer-members did not have a significant increase in income as result of GAP certification. We talked with a representative of the exporter to the Netherlands and she said that GAP is not required for export and that Dutch importers perform their own quality control checks including pesticide residue so GAP certification will not influence export procedures or increase the price of exported pomelo. Since My Hoa cooperative is the only citrus producer that received GAP certification probably the most beneficial aspect was positive media coverage. The Vice-director of My Hoa Cooperative also expressed doubt that the certification will be renewed after it expired (GLOBALG.A.P certificate is valid for 1 year). That of course does not mean that implemented g.a.p. will not continue. A similar case happened with a vegetable grower in Dalat. He was awarded EurepGAP certification in 2006 but the certificate was not renewed afterwards. Nevertheless, production is still at a high level of compliance with GLOBALG.A.P. and the grower still uses his expired certificate for marketing purposes.

In Dong Thap province our project team worked with a group of 11 farmers from Long Hau village, Lai Vung district, with the aim of achieving VietGAP certification. For this group VietGAP is more appropriate than GLOBALG.A.P. because they grow Tieu mandarin, which is a very popular variety on the Vietnamese market but has low prospects for export. Technical support and training of farmers is provided by VACVina members and extension officers from Lai Vung district Plant Protection Station. The Farmer Union and local government have been providing great support including a subsidy towards the building of toilets in the field. Both local government and Farmer Union see GAP certification as a very prestigious achievement because of the political support the accreditation scheme has from the central and provincial government.

The approach to GAP implementation with the Long Hau village group is very different to that in My Hoa. The Long Hau group has been implementing GAP in a much longer process of learning and making adjustments in production and practices by themselves, under guidance of VACVina consultants, but nothing has actually been done for farmers by the consultants. This group of growers is much smaller than My Hoa with only 11 members cultivating a total area of 3.45 ha. They are all neighbours with adjacent properties and the initiative for GAP certification and leadership in implementation came from two members of the group with the highest production and good connection with the market. The group members sell their product at traditional markets just before the Vietnamese New Year holiday (Tet) so they achieve a very high price with the average net profit per group member being 70,000,000 VND or 226,470,000 VND/ha, which is 3 times above industry average. So the group members are high achievers with the vision that VietGAP certification will differentiate their product on the market and they hope to capitalise on that by getting a higher price as a result of selling their product to supermarkets or/and on their own market stall in Ho Chi Minh City clearly marked with the sign "Safe mandarins". The group leaders seized the opportunity to access project funds and local political support to implement VietGAP to potentially maximise profit from production and to secure a leading role in the community as the champions of new government initiatives. The question remains as to whether the few subsidised success stories will be enough to spark implementation on larger scale. High level of government support will help scaling up and it is

possible that increasing demand for supermarket produce will subsequently increase production of GAP certified fresh products in the future. However, because there is higher public anxiety about pesticide residues in vegetables than other fresh products it is likely that GAP certification will be more readily sought by vegetable producers than by citrus and other fruit producers.

Conclusions

GAP standards and certification schemes, with the current level of support they are receiving from the Vietnamese Ministry of Agriculture and Rural Development, provide a good framework for a transition towards more sustainable production of safe fruit and vegetables. MARD have provided prerogatives for GAP implementation through development of a series of manuals for GAP implementation for a variety of crops and by authorising government and non-government entities to provide auditing and certification of GAP implementation. If embraced by supermarkets and made a prerequisite for acquisition of fruit and vegetables, GAP certification will have an impact on farmer production and transformation towards more sustainable agro-food systems. Equally important is that if any implementation of VietGAP goes ahead it will initiate new and strengthen existing farmers' associations and cooperatives. The cost and complexity of GAP implementation and certification is beyond the capacity of the vast majority of Vietnamese farmers. Hence to be able to implement GAP and access supermarkets, farmers will need to form associations or cooperatives. However, as stated by Paule Moustier et al. (2006), "the key point is that these organisations should build from farmers' own initiatives rather than from administration". We should also add that it is equally important for farmer associations and success of GAP implementation that the farmers who are members and implement GAP are able to reap economic benefits in a relatively short timeframe.

Indeed if farmer associations sell their VietGAP certified fruit and vegetable to supermarkets then they can expect increased income. Increased values of 42% for litchi, 25% for vegetable from Soc Son and 400% for water convolvulus produced around Ho Chi Minh City have been reported when these products were sold through supermarkets. However only 0.9% of the total volume of fruit and vegetables is sold in supermarkets with 85% sold on the street or at ordinary market stalls (Moustier et al., 2006). So if the government objective is to raise food safety for the majority of citizens then the price premium for GAP certified products should be realised at traditional markets and not just supermarkets. Since that is unlikely to happen VietGAP certification will be probably limited to a relatively small number of producers supplying a relatively small proportion of wealthier citizens.

The benefit of developed GAP standards and the implementation manuals can be maximised if they are used as a framework for development of the curriculum for participatory farmer education. Standards are by definition rigid and cannot be modified by farmers in a participatory process but the way practices are changed to reach the required standards may still be defined by the farmers. Donors may support implementation of certain parts of the GAP requirements that benefit farmers and consumers and make production more sustainable and reduce impact on the environment without ever reaching certification level. However, if and when demand for certified products rise and provide economic stimulus for farmers to seek certification then the farmers that were part of the GAP education process will be able to make the necessary adjustments and supply GAP certified fruit and vegetables.

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