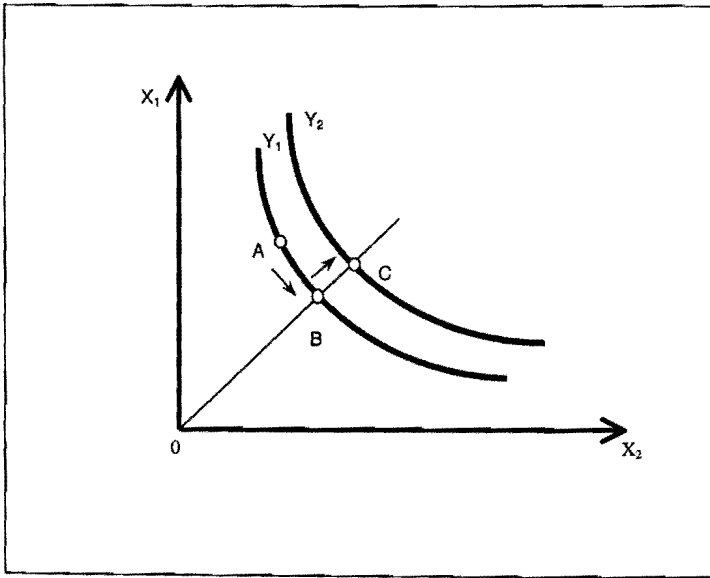


Market Access and Agricultural Productivity in Vietnam

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VERLAG GRAUER · Beuren · Stuttgart · 2005

Chapter Eight

8. SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

8.1 Summary

8.1.1 Background and Objectives of this study

At present, Vietnam is undergoing a transformation from a self-sufficient economy to a market oriented economy. Cho (2001) has shown qualitatively the following broad four groups of factors which are of primary importance for the dynamic and sustainable development of agriculture and rural economy: The first is the condition of infrastructure surrounding farming businesses such as irrigation and drainage systems, rural roads and transportation facilities, telecommunications, and rural credit systems. The second is the agricultural technology of both production and processing, or, in other words, land saving and labor saving technologies. The third is the relative price of agricultural inputs and outputs, availability of markets for agricultural products, and improved marketing system. And the fourth is supporting organizations and services for individual farmers by means of extension service of improved technologies and information, and agricultural cooperative activities. In the Vietnamese context, physical infrastructure and marketing system development are the most important factors. These external factors influence the farmers' decision-making behavior on farm resources reallocations and the use of production inputs to maximize their profit through production specialization and intensification. The various effects of the above factors depend, in general, on the farmers' access to markets. Access to and participation in agricultural markets can positively influence productivity in developing countries through the efficient allocation of scarce resources and through the encouragement of an increased use of inputs such as fertilizers, pesticides and improved seed varieties. Therefore, the study will focus on the effects of markets on agricultural productivity in North Vietnam. The specific objectives of the study are:

- 1) To examine the production characteristics of individual farms and farming systems in North Vietnam

- 2) To analyze the impact of markets on agricultural productivity and of intensification on farmers with different farm household styles and different market access.
- 3) To determine constraints, potentials and opportunities to improve production and marketing for cash agricultural products in North Vietnam.
- 4) To give quantitative recommendations to policy makers regarding investments in market access, which can accelerate rural development, increase family incomes and thus achieve food security.

The study is conducted under the following hypotheses:

- 1) An improved market access positively affects agricultural productivity via intensification process and specialization of agricultural production.
- 2) Gains from improved market access are not equally distributed among strong and weak producers because of the difference in endowments and in the ability to take advantage of improved economic conditions.
- 3) Access to markets promotes an efficient allocation of resources, which in turn induces the use of external inputs.

8.1.2 Methodology

The study combines analytic methodologies including descriptive statistical analysis, partial analysis and also a comprehensive approach through two models as follows: (1) a positive analysis –a regression model with estimated simultaneous equation systems by LIMDEP 7.0 to estimate the effects of various factors on agricultural production; (2) A normative model in agricultural marketing analysis as an interregional trade model and four versions solved by maximizing a net welfare function. The function was solved by the General Algebraic Modeling System (GAMS 386).

This study used two data sources including primary data and secondary data. The primary data were collected through farm household and trading household surveys carried out in Son La province (Mai Son and Yen Chau districts) and Ha Noi Province. The surveys covered about 275 farm households and 110 trade households. The farm households belonged to a total of 18 communes (12 in Son La and 6 in Ha Noi) that

were intentionally selected at varying distances to the local and regional markets. The primary data form the basis of the partial and the econometric analyses in the study to assess the impact of access to markets on input use and productivity, and rural market analysis.

Secondary data are used mainly in the interregional trade model covering the northwest (including Son La province), the northeast, the Red River Delta (including Ha Noi province) and the Rest of the country (ROC), used to represent all other producing and consuming regions. Four crops- rice, maize, cassava and peanut were selected and included in the model.

8.1.3 Results

8.1.3.1 Partial Analysis Results

The results of the partial analysis can be summarized as follows:

- (i) In the two districts (Mai Son and Yen Chau), characteristics of farm households are different according market access levels. The majority group (Kinh and Thai) is located with good levels of market access, while minority groups usually live in remote areas. Education level of the farm household heads with good market access is higher than it is for poor market access areas. Greater participation in social organizations by farm households with good market access was observed when compared to households with poor market access. Obviously farm households with good market access invested more in production machines and tools as well as in the construction of buildings than farms with poor market access.
- (ii) Market access also influences the scale of animal industry in farms, it means that when the farmers can access markets easily, they raise more herds of pig and poultry, and also had higher proportion of marketed orientation for animal products when compared to those with poor market access.
- (iii) Income sources of farm household come mainly from four activities - crops, livestock, fish and off-farm, of which the cropping makes up the largest proportion of farm income at 80%. However, farm household income is

- influenced by other factors like income sources and scale of production industries within farm and market access factors.
- (iv) In Mai Son district, market access influences cropping patterns more obviously than could be observed in Yen Chau. In Mai Son the majority of fruits and maize cultivation is allocated to regions with good market access, and the proportion of land used to grow fruits trees declined as access to the market becomes more difficult. In case of paddy rice, it is mainly a domestic crop but is grown at the highest rate of land in the good market access farms in Yen Chau. This is because a farmer's decision regarding crop patterns could also be strongly influenced by topography and other purposes.
 - (v) There is a positive and significant relationship between the use of mineral fertilizers and access to markets in the districts. The more market-oriented farmers with easy access to the market use proportionately more fertilizer per unit area than those who are less market oriented and have difficult access to the markets. Similar trends are observed in the use of pesticides and the use of high yield variety seeds. An analysis of input use by farm size yielded mixed results. In both of the districts, the level of fertilizer used by farmers declined with the scale of operation. Similar trends were also observed in the use of pesticides and the high yield variety seeds as well as other variables such as labor expenses, value of machines and tools, credit etc.
 - (vi) Better access to markets has a positive influence on the aggregate productivity of farms in all farm scales in both districts. In Mai Son, farms have a higher aggregate productivity compared to the farms in Yen Chau.

8.1.3.2 Econometric Model Results

A simultaneous equation model with five equations was developed and estimated by using the three-stage estimation technique (3SLS). The overall result of the model was acceptable because most of the variables in the model carried the expected signs and were significant at acceptable levels of significance. The market access also performed well as it carried, in most cases, the right signs and was significant. The main results of this analysis method can be summarized as follows:

- (i) According to the derived elasticities of the model, a 10% improvement in market access to the regional market (reduction of the distance) brings forth a 10.6% improvement in aggregate productivity in the North. This total increase consists of a 3.6% specialization effect and a 7% intensification effect.
- (ii) In Mai Son, an improvement of access to the local markets by 10% would increase aggregate productivity by 9.2%, of which 3.5% would be specialization effect and 5.7% intensification effect. In Yen Chau, a 10% improvement of market access to local market results in a 3.7% improvement in aggregate productivity, of which 1.2% is specialization effect and 2.5% intensification effect.

These results seem to indicate that the aggregate agricultural productivity in the study areas could be enhanced through the improvement of access to markets, with the potential for productivity improvement appearing higher in Mai Son than in Yen Chau. The results also indicate that the regional markets are more important than the local markets.

8.1.3.3 Development of private trading systems

- (i) The local private traders have played important roles in the distribution of agricultural products in the study areas. They have set up a system with different suppliers for agricultural products not only in the district areas but also in the larger areas in Son La province. At the same time, they have contacts with many external traders from many provinces of North Vietnam. They have contributed to the transaction of millions of tones of agricultural commodities and non-agricultural goods through interregional trade.
- (ii) They have built a short term and long term business strategy to attract suppliers and clients through their activities such as diversification of products and activities, and other business policies such as credit and in kind incentives for farmers and collectors. They expand complementary activities such as transport, storage and processing thus creating jobs for household members, increasing incomes and increasing value of commodities.

- (iii) According to traders' opinions although crop products in these areas are abundant - including grains like maize, cassava, rice; fruit trees like mango, longan, litchi, plum and apricot; industrial crops like sugarcane, tea, coffee, etc. the product scale often is small and competitiveness of agricultural products is weak in the regional market. With the exception of maize seed, market signals are not reflected positively in crop production in Son La. Therefore, it is necessary to review thoroughly the agricultural production strategies for provincial or interregional markets.
- (iv) The study shows that the problem in the development of a marketing system for agricultural products, is the trade relationships among the actors involved, particularly between farmers and local private traders. Key reasons could be poor infrastructure and limited information about markets and market price.

8.1.3.4 Interregional Trade Analysis

Four versions of the interregional trade model were specified and examined separately. The four model versions comprised two cases of normal trade with and without a supply shift (model version 1 and 3, respectively) and two other cases of trade with reduced transport costs with and without a supply shift (model version 2 and 4 respectively). These models were conceived to depict the twin processes of specialization and intensification in sequence, and to quantify their effects in terms of production, welfare and equity.

- (i) The results show higher optimal production levels in cases with lower transport costs than those without for all the commodities included in the model (paddy, maize, cassava and peanut). Comparison of results of model version 1 (a case of normal trade without a supply shift) and model version 2 (a case of trade with lower costs but without a supply shift) indicates an increase in optimal production of paddy from 31,509,000 t to 31,519,000 t representing an increase of about 0.03%. The optimal maize production increases at the same time from 1,980,000 t to 1,986,000 t, a 0.3% increase. The optimal production of cassava increased by about 0.05% from 1,958,000 t to 1,959,000 t. And the optimal production of peanut increased by 0.3% from 356,000 to 357,000 t. The traded volume of paddy, maize, cassava and peanut increased by 2.8%, 9.3%, 13.5%

and 2% respectively. The overall effect of trade or the specialization effect is thus about 0.05%. The volume of the commodities traded increase by about 3.6%.

- (ii) Comparison of the results of model version 2 and 4 gives the effects of the supply shift or intensification effects. The results of the model versions indicate an increase in production of paddy by about 4%, in maize of 5.6%, cassava of 1% and peanut of 3.6%. The overall increase in production for all the crops or intensification effect is about 3.9%. The difference between model version 4 and 1 shows overall effects on twin processes of specialization and intensification within increase in production for all the crops at 3.95%.
- (iii) The results of the models reveals that welfare measured by the consumer and producer surpluses in the model also increased with lower transport costs. Land resources would be saved in the optimal scenarios.

8.2 Conclusion and Policy Implications

The findings in the study, including qualitative and quantitative ones, confirm the significance of the development of the marketing system, the improvement of market access and interregional trade in the agricultural and rural development of the mountainous regions in Vietnam, where emphasis is placed on the improvement of aggregate agricultural productivity. There is a potential to improve market access and thereby to increase farm incomes and improve the living standards of local people, particularly minority groups in remote areas. At the same time, the results of the study offer concrete recommendations for macro and micro decision-makers on related issues. The major conclusions of this study are:

- (i) The study clearly quantifies the impact of access to the markets on aggregate agricultural productivity through specialization and intensification. The study presents both literature and empirical analyses to show that under the market oriented economy, one of the important factors on which farmers base the decision to specialize their production are an improvement in market access to lead farmer's specialization and using comparative advantages of economy scale to increase agricultural productivity of farm land. Consequently, an improvement in market access would encourage farmers to use high yield

variety seeds and thus result in an increased volume of inputs per land farm unit. Previous studies have mainly focused on factors such as technology, farm financial status and the expertise of farmers.

- (ii) The study discovered as yet un-exploited potentials of crop productivity in the mountainous areas through concentrated and intensive approaches which emphasize an increased use of modern inputs like chemical fertilizers and high crop yield varieties in areas where extensive farming practices exist, while agricultural land resources are limited and the main income sources of farmers are from crops.
- (iii) The development of interregional trade, trade freedom and the reduction of transportation costs would promote the process of efficient allocation for production resources in farm households as well as the use of relative comparative advantages of among regions. Using the model of interregional trade, relationships of supply and demand regions and transportation activity for certain agricultural commodities were established. The influence of a 10% decrease in transport costs on agriculture through specialization and intensification was quantified, by tracing the processes. Commodity flows and commodity volume traded among regions as well as surplus of producers and consumers were calculated.
- (iv) In Vietnam, encouraging the participation of private sectors in the marketing systems would contribute to agricultural development, job creation and income improvement for local people, which also conforms to the characteristics of small-scale production in agriculture in the mountainous areas.

Based on the findings of this study, the following policy implications may be formulated:

- (i) The policies on rural infrastructure development should include the following components: firstly newly constructing and upgrading road systems from production areas to markets, particularly in mountainous remote villages and communes; secondly enhancing transportation means and replacing traditional transport means such as human shoulders, ox-carts, etc. by truck to ship production inputs as well as agricultural products to the markets. Thirdly, constructing and developing formal market systems for villages, commune, districts and regions including retail and wholesale markets. Fourthly designing

and constructing storage and processing facilities to reduce transport costs and losses. Innovating and upgrading the communication systems would efficiently provide market and technological information to farmers, particularly to people in remote areas.

- (ii) Development of legal and institutional frameworks aimed at encouraging regional and interregional trades through measures such as freedom of trade, discharge of taxation and non-taxation for commodity transportation, etc. Especially in the mountainous areas, it is necessary to encourage participation of private sectors in marketing and trading activities for both agricultural and non-agricultural commodities like storage, processing, distributing etc. Formulating mechanisms and rules to solve problems regarding the relationships between actors in the markets and encourage formulation of rural economic organizations like agricultural cooperatives and trade associations, etc. to increase equality, transparency and efficiency in marketing activities. Policies and frameworks can promote agricultural extension, credit provision and capacity building for local people like poor farmers, processors, traders, etc.
- (iii) The study also indicates that intensification effect of market access in terms of roads is greater than specialization; the level of modern input use per hectare in the mountainous areas is lower than in the plains. Therefore, it is necessary to facilitate and encourage capital-intensive farming approaches, increasing volume of modern inputs used, and expansion of areas planted by high yield variety in the study areas. Environmental effects however, also are considered at the same time. Other policies related to agricultural specialization and diversification are the concentration of agricultural land, agricultural and forestry land allocation to farm households as well as encouraging the development of integration farms to exploit and combine resources and products and by-products of enterprises in farming systems.

9. Marktzugang und landwirtschaftliche Produktivität in Vietnam

9.1 Zusammenfassung und Schlussfolgerungen

Marktzugang hat einen positiven Einfluss auf die landwirtschaftliche Produktivität. Durch Preissignale erfährt der Landwirt wo seine komparativen Vorteile liegen (Spezialisierung) und dies regt den Einsatz von Düngemitteln, Pflanzenschutzmittel und Hohertragsorten (Intensivierung) an. Die vorliegende Arbeit wurde in Nordvietnam durchgeführt. Folgende analytische Methoden wurden kombiniert: deskriptive Statistik, partielle Analysen und zwei umfassende multiple Analysen. Die multiplen Analysen umfassen eine positive Regressionsanalyse, welche ein Mehrgleichungssystem simultan schätzt, um die Effekte von verschiedenen Faktoren auf die landwirtschaftliche Produktivität zu erfassen; und eine normative Analyse, bei der die Wohlfahrt in einen interregionalen Handelsmodell maximiert wird. Hauptfokus dieser Arbeit liegt auf Marktinfrastruktur und Pflanzenproduktion.

In Nordvietnam führt eine 10% Verbesserung des Marktzugangs (durch eine Verkürzung der Entfernung) zu einer 10,6% Verbesserung der landwirtschaftlichen Produktion. Hierbei tragen die Spezialisierungseffekte 3,6% und die Intensivierungseffekte 7% bei. Auf Distriktebene hat eine 10% Verbesserung des Marktzugangs in Mai Son zu einer Steigerung der landwirtschaftlichen Produktivität von 9,2% geführt, wobei die Spezialisierungseffekte 3,5% und die Intensivierungseffekte 5,7% beitragen. Im Distrikt Yen Chau würde durch eine Verbesserung des Marktzuganges von 10% eine Produktivitätssteigerung von 3,7% erzielt werden, bestehend aus 1,2% Spezialisierungseffekt und 2,5% Intensivierungseffekt. Diese Ergebnisse machen deutlich, dass eine Verbesserung des Marktzugangs im Untersuchungsgebiet zu einer Verbesserung der landwirtschaftlichen Produktion führen könnte. Vergleicht man die zwei Distrikte ist das Potenzial der Produktivitätssteigerung durch verbesserten Marktzugang für Mai Son höher als für Yen Chau.

Die Ergebnisse der normativen Analyse im interregionalen Handelsmodell zeigen, dass die optimalen Produktionsmengen für alle Produkte (Reis, Mais, Maniok und Erdnüsse) sich erhöhen, wenn die Transportkosten sinken. Vergleicht man die Ergebnisse des

Basislaufs (Version 1) mit dem Szenario einer 10% Senkung der Transportkosten (Version 2) erhält man folgende Ergebnisse: Die optimale Reisproduktionsmenge ändert sich von 31509 Tausend Tonnen im Basislauf auf 31519 Tausend Tonnen im Szenario, sprich eine Produktionssteigerung von 0,03%. Die optimale Maisproduktion steigert sich von 1980 Tausend Tonnen auf 1986 Tausend Tonnen also eine 0,3% Steigerung. Die optimale Produktion von Maniok steigert sich um 0,05% von 1958 Tausend Tonnen auf 1959 Tausend Tonnen. Die optimale Erdnussproduktion steigert sich um 0,3% von 356 auf 357 Tausend Tonnen. Insgesamt werden größere Mengen an Reis, Mais, Maniok und Erdnüsse (2,8%, 9,3%, 13,5% und 2%) gehandelt wenn die Transportkosten um 10% sinken. Der Gesamteffekt, das heißt der Spezialisierungseffekt beträgt 0,05%, und insgesamt werden 3,6% mehr Produkte gehandelt. Dies führt zu einer Intensivierung der Produktion als Folge der jeweiligen Spezialisierung, und einer Steigerung der Produktion bei Reis um 4%, bei Mais um 5,6%, bei Maniok von 1% und bei Erdnüssen von 3,6%. Somit steigert sich die Produktion durch Spezialisierungs- und Intensivierungseffekte insgesamt um 3,9%. Auch die Gesamtwohlfahrt, die Produzenten- und Konsumentenrente steigen als Folge von einer Reduzierung der Transportkosten. Außerdem werden Bodenressourcen eingespart.

Zusammenfassend ist festzuhalten: die Entscheidung eines Landwirts, in einer Marktwirtschaft, sich zu spezialisieren hängt von der Verbesserung des Marktzugangs ab. Dieses führt zu einer Steigerung der landwirtschaftlichen Produktivität von Ackerland. Weiterhin regt es Bauern an Hohertragssorten zu kaufen, was zu einer Steigerung des Einsatzes von weiteren Produktionsmitteln pro Flächeneinheit führt. Die Ergebnisse der Arbeit zeigen, dass es unerschlossene Potentiale in der pflanzlichen Produktion in der extensiven Bewirtschaftung in den Bergregionen Nordvietnams gibt. Da in dieser Region die Bodenressourcen limitiert sind und die Haupteinkommensquelle aus der Landwirtschaft stammt, sollte ihre Produktivität durch Konzentration und Intensivierung bzw. einen stärkeren Einsatz von modernen Produktionsmittel wie Mineraldünger und Hohertragssorten angekurbelt werden. Durch die Verbesserungen des interregionalen Handels, Marktfreiheit und die Senkung von Transportkosten werden Produktionsressourcen mobilisiert, weil sowohl auf einzelbetrieblicher als auch regionaler Ebene die jeweiligen komparativen Vorteile wahrgenommen werden. Verbesserter Handel wirkt sich auf die Landwirtschaft durch Spezialisierung und Intensivierung aus und verbessert sowohl die Konsumenten- als

auch die Produzentenrente. In Vietnam spornt die Teilnahme am privaten Sektor des Marktes die Entwicklung der Landwirtschaft an; sie schafft Arbeitsplätze und verbessert die Einkommen, welcher zu Verbesserungen der kleinbäuerlichen Strukturen in den Bergregionen führten.

9.2 Politikempfehlungen

Die Politikempfehlungen dieser Arbeit richten sich vor allem auf die Entwicklung der ländlichen Infrastruktur und umfassen vier Komponenten: Erstens soll das Straßennetz ausgebessert und erweitert werden, so dass die Produktionsregionen besser an den Marktregionen angeschlossen sind. Zweitens soll die Art der Transportmittel modernisiert werden. Ochsentransport und Tragelasten sollen durch Lastwagen und Schiffe für den Transport von Produktionsmitteln und Erzeugnissen ersetzt werden. Drittens sollen Marktplätze auf den Ebenen Dorf, Kommune und Distrikt für den Groß- und Einzelhandel erschlossen werden. Viertens sollen Lagerhallen und Weiterverarbeitungsfabriken aufgebaut werden um Transportkosten und -verluste zu senken. Außerdem könnten innovative und verbesserte Kommunikationssysteme den Landwirten effektiver mit Markt- und Technologieinformationen versorgen, besonders in abgelegenen Gebieten.

Weiterhin sollten institutionelle Rahmenbedingungen, die den regionalen und interregionalen Handel unterstützen, durch Maßnahmen wie Marktfreiheit, Steuererlasse und eine Regelung der Nicht-Besteuerung des Transportes von landwirtschaftlichen Gütern eingeführt werden. Besonders in den Bergregionen ist es dringend notwendig die Partizipation des privaten Sektors in Markt- und Handelaktivitäten sowohl für landwirtschaftliche als auch nicht-landwirtschaftliche Güter (wie z.B. Lagerhallen, Verarbeitungsbetriebe und Speditionen) anzukurbeln. Weiterhin sollten Bereiche wie landwirtschaftliche Beratung, Kreditbereitstellung und Ausbildung der lokalen Bevölkerung gefördert werden.

Es ist notwendig, kapitalintensive Investitionen in der Landwirtschaft, den Einsatz von modernen Inputs und die Verbreitung von Hohertragssorten im Untersuchungsgebiet zu fördern. Ebenso müssen die Effekte auf die Umwelt berücksichtigt werden. Weitere

Aspekte der ländwirtschaftlichen Spezialisierung und Diversifikation sind die Konzentration von landwirtschaftlichen Flächen, die Zuteilung von ländwirtschaftlichen und forstwirtschaftlichen Flächen an private Haushalten so wie die Unterstützung von Versuchsbetrieben, die Ressourcen und Nebenprodukte optimal für die landwirtschaftlichen Produktion nutzen.