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Advanced Global Agricultural Sciences 1
Farm Management

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農学国際特論Ⅰ
農業経営

農業・資源経済学専攻
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1. Economy of farm household 農家経済

Economy of farm household 農家経済

①Household 家計＝Consumption economy消費経済

Supply of own labor, land, capital for production
保有する労働、土地、資本を事業に供給

Distribution of value added 付加価値の分配

Consumption of goods and services 財・サービスの消費

Reproduction of labor 労働の再生産

②Enterprise 経営＝Production economy生産経済

Business by using labor, land, capital supplied from inside and outside of household 家計や世帯外から供給された労働、土地、資本を用いて事業活動

Sectors of production economy for farm households 農家の生産経済活動部門

	Agriculture 農業	Non-agriculture 非農業
Self-employed 自営		
Employed 雇用		

2. Farm business 農業経営

= Independent and sustainable organization doing the business of agriculture for the certain purpose.

= 一定の目的の下に農業というビジネスを行う独立した持続的な組織

Business ビジネス

= Sustainable activities of making decision under the self-responsibility, utilizing managerial resources, creating products or services, and distributing the results to stakeholders.

＝自己責任の下で意思決定を行い、経営資源を利用し、製品やサービスを生み出し、その成果を関係者に分配する活動であり、同時にこの活動には持続性が求められる。

1) Three aspects of Farm: Technology - Economy -Management

農業経営の3つの側面：技術・経済・マネジメント

①Technology　技術の側面

To procure the resources necessary for production

To create the productive power by combining and converting them technologically

To produce products and services

生産に必要な資源を調達して、それらを技術的に結合・変換して生産力を生み出し、製品やサービスを生産する。

Related to issues of “Farming System” which affects organization of farm such as scale and combination of crops.

農法の問題に関連する。農法は、経営規模や作目の組み合わせなどの経営組織のあり方にも影響している。

Revenue / Cost : Net Return = Sales - Production Cost

= Capital Interest + Land Rent + Profit

収益 / 費用：　純収益＝粗収益－生産費＝資本利子＋地代＋利潤

②Economy　経済の側面

To make the form of a business under the socio-economic constraints

社会経済的な制約の下で、ビジネスの形態を作る。

Related to the issues of ownership of managerial resources

経営資源の所有の問題に関連する。

Need to note the diversified business forms of farming. (Family farms with qualitatively different types, Non-family farms, etc.)

家族経営でも質的に異なるものがあるほか、家族経営以外の形態もあり、形態が多様化していることに注目する必要がある。

Revenue / Cost : Income = Sales - Managerial Cost

= Equity Interest + Owned Land Rent

+ Family labor cost + Profit

収益 / 費用:　所得＝粗収益－経営費

＝自己資本利子＋自作地地代＋家族労働費＋利潤

③Management マネジメントの側面

For realizing management philosophy and goals,

To develop a management strategy, organizing the management organization,

To carry out efficient and effective management activities, such as production, sales, procurement, labor, finance, information

経営理念、経営目標の実現に向けて、経営戦略を策定し、経営組織を組織し、生産・販売・購買・労務・財務・情報などの経営活動を効率的かつ効果的に遂行すること。

Composed of five functions, such as planning, organization, instruction, coordination, and control.

計画、組織化、命令、調整、統制の5つの機能から構成されている。

Area of management

(i) Management for business environment

Real farming exists in the unstable business environment created by markets of managerial resources, products and services, and the governments.

It should adapt to its business environment, competing with competitors and building good relationships with trading partners.

In addition, it should influence outside of the farming for changing its business environment, if needed

マネジメントの領域

(i) 環境のマネジメント

現実の農業経営は、経営資源を調達する市場、製品やサービスを販売する市場、さらには政府によって形成される変化しやすい経営環境のなかに存在している。

農業経営は、競争相手と競争し、取引相手との関係を築きながら、経営環境に適用しなければならない。

また、必要に応じて、経営環境を変化させるために、経営の外部に働きかけることも必要である。

(ii) Management of organization

Inside of farming organization, managers engage themselves in promoting others to realize what they want.

Managers should facilitate the collaboration with others in the organization as a group of different individuals.

(ii) 組織のマネジメント

農業経営の内部では、経営者は自分以外の人を通して自分が実行したいことを進めてもらうという活動を行っている。

経営者は、人の集まりとしての組織のなかで、他人との協働を円滑に進める。

Management for business environment: toward the outside of farming

Management of organization : toward the inside of farming

↑

Both often contradict each other.

Ex.) Introduce new technology to give a competitive edge.

→ There is a risk the stability of the organization may be impaired.

To overcome such contradiction brings growth and stability of business.

Need for management of growth and stability

環境マネジメント: 経営外部に向けたもの

組織マネジメント: 経営内部に向けたもの

↑

両者はしばしば矛盾する。

例）競争力を付けるために新技術を導入

しかしその結果、組織の安定性が失われる恐れがある。

このような両者の間の矛盾を克服してこそ、経営の成長と安定がもたらされる。

成長と安定のマネジメントの必要

3) Basic types of the six basic farm types

農業経営の基本六類型

Type 1. Small subsistence-oriented family farm

小規模自給自足指向家族経営

Type 2. Small semi-subsistence or part-commercial family farm

半自給自足・半商業的家族経営

Type 3. Small independent specialized family farm

小規模独立型専門的家族経営

Type 4. Small dependent specialized family farm

小規模従属型専門家族経営

Type 5. Large commercial family farm

大規模商業的家族経営

Type 6. Commercial estates

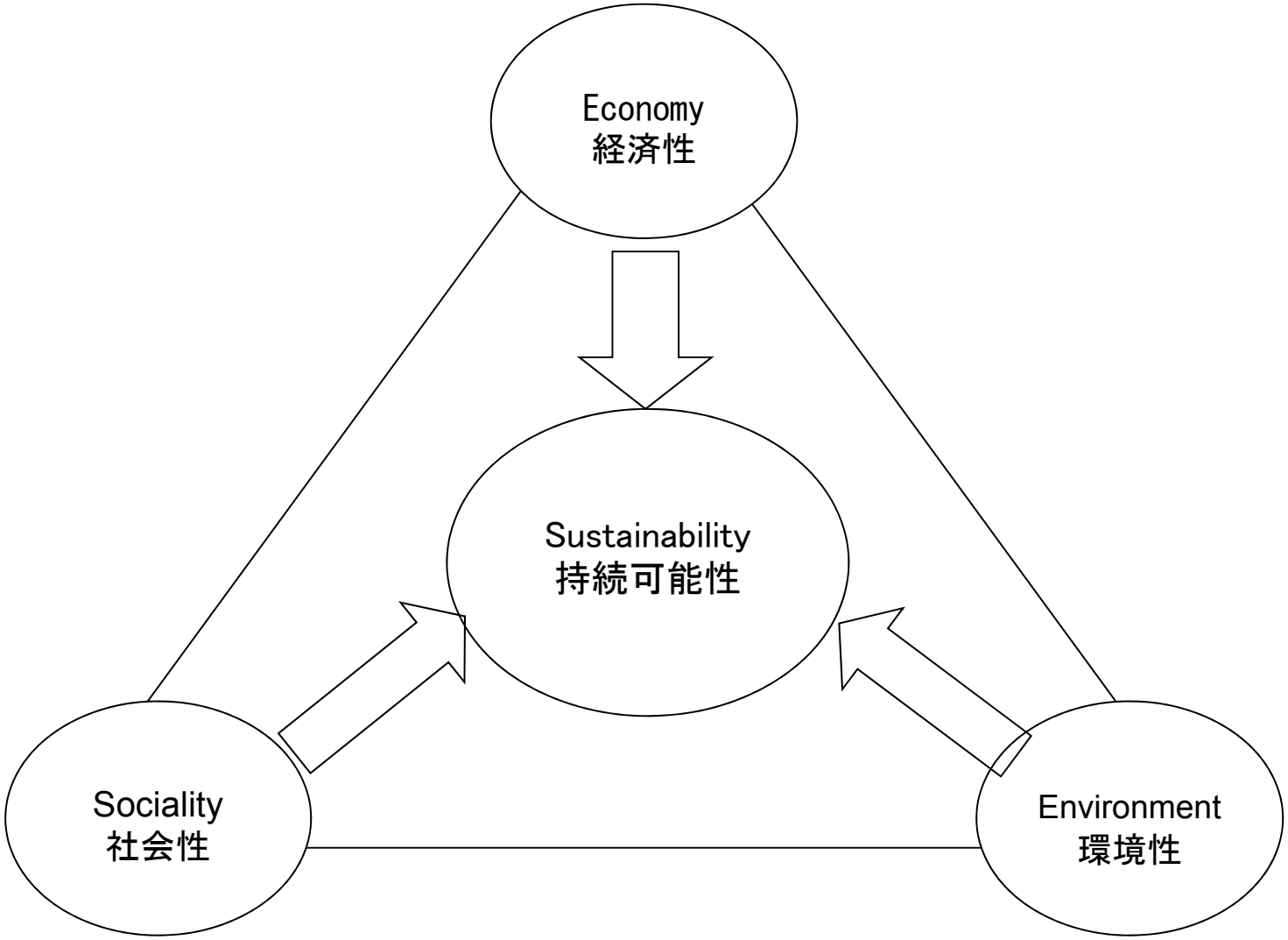
商業的農場経営

FAO（1997）*Farm Management for Asia: a Systems Approach*

3. Sustainability　持続可能性

Three conditions of the sustainable growth of farm business

農業経営が持続的に成長していくための3つの条件



Conditions for sustainable growth of farm business

① Economy: Required to survive in the competition.

② Sociality: Required to gain social acceptance and social cognition.

③ Environment: Required to adapt to the natural environment.

Levels of three conditions required depends on age and region.

Farming business should realize sustainability, maintaining a balance of three conditions.

農業経営の持続的成長のための条件

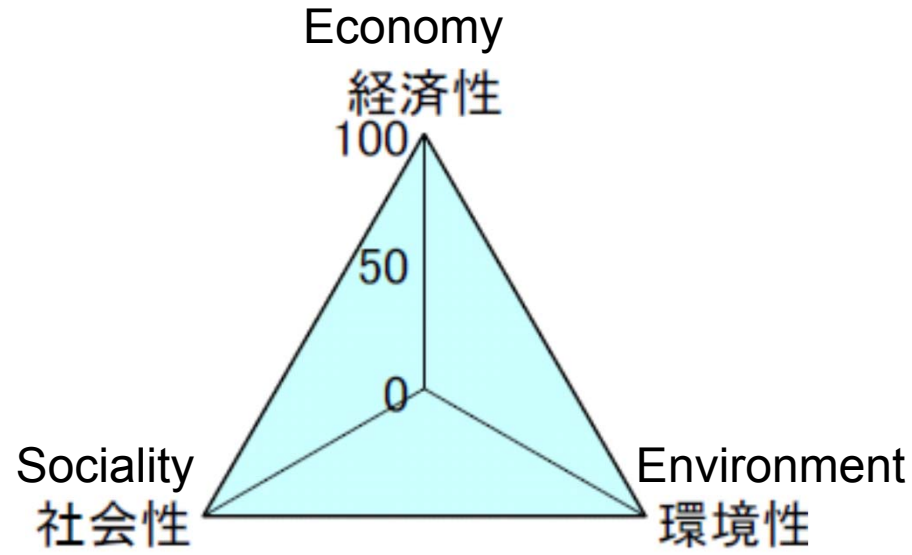
①経済性　農業経営が競争の中で勝ち残るために必要。

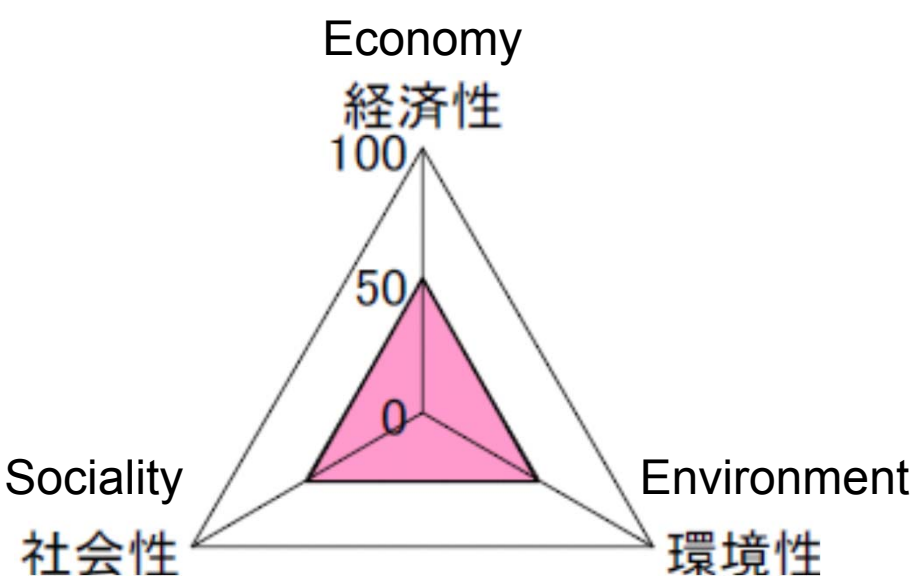
②社会性　農業経営が社会的認知ないしは社会的受容を獲得するために必要。

③環境性　農業経営が自然環境に適応するために必要。

3つの条件が要求する水準は、時代や地域によっても異なる。

農業経営は3つの条件のバランスをとりながら、持続可能性を発揮することが必要である。


Economy
経済性
100
50
0
Sociality
社会性
Environment
環境性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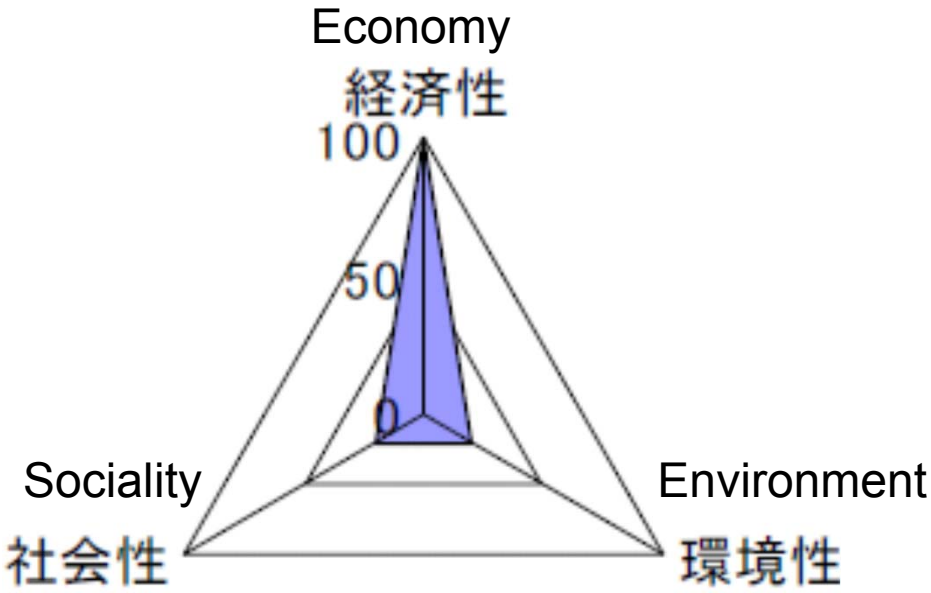

Economy
経済性
100
50
0
Sociality
社会性
Environment
環境性

4. Process of management マネジメントのプロセス

1) Management cycle マネジメント・サイクル

plan→ do→ check→ act…

計画　実施　　評価　　改善

① Construction of future plans 将来構想の構築段階

Establishment of a management philosophy and long-term management plan

経営理念の確立と経営の長期計画を策定

② Construction of business strategy 経営戦略の構築段階

Basic plan for the realization of business goals

Develop an implementation plan in the actual project

経営目標の実現に向けた基本計画を策定

実際の事業実施における実施計画を策定

③Implementation of the plan 計画の実施

④ After the implementation of the plan 計画の実施後

Comparative evaluation of the results and the goals set in each plan.

Plan for the next fiscal year and revise the basic plan if needed.

各計画で設定した目標と実際の成果とを比較評価。

次年度の計画、必要に応じて基本計画の見直し。

2）Objective of management 経営目的

Composed by managerial principle and managerial goal

経営理念と経営目標から構成される。

Management principle 経営理念

A philosophy, ideology and beliefs worth trying to achieve through management activities. The basic idea of “ for what” or “how” on business.

経営行動を通じて達成しようとする価値・信念・思想・哲学。

「経営が何のために存在しているのか」、「経営をどのようなやり方で行うのか」などについての基本的な考え方。

Management goal 経営目標

Concrete contents for achievinge the management principle through management activities.

経営行動を通じて経営理念を実現するために設定した具体的な内容。

3) Management goal 経営目標

①Case of subsistence oriented family farm 自給志向家族経営の場合

The main management objective is to maintain, survive and inherit family and homestead.

To ensure revenue necessary to achieve the purpose above is one of the concrete management goal.

家族・家産の維持存続・継承が主要な経営目的。それを実現するために必要な収益の確保することが具体的な収益目標となる。

②Growing process of farm into “farm as business”

農業経営が「ビジネスとしての農業経営」へと成長していく過程

Management objective is changing with the growth of farming.

Income comparable with industries, profit, innovation, demand creation, business expansion, sustainable growth etc.

成長とともに経営目標は変化する。他産業並みの所得、利潤、イノベーション、需要創造、事業の拡大、持続的成長など。

Income

= Sales - Managerial Cost

= Equity Interest + Owned Land Rent + Family labor cost + Profit

Family labor income

= Income - Equity Interest + Owned Land Rent

= Family labor cost + Profit

Profit

= Sales - Equity Interest - Owned Land Rent - Family Labor Cost

→ Return for the managerial ability

所得＝粗収益－経営費

＝自己資本利子＋自作地地代＋家族労働費＋利潤

家族労働報酬＝農業所得－自作地地代－自己資本利子

＝家族労働費＋利潤

利潤　＝粗収益－物財費－労働費－地代－資本利子

→経営者能力への報酬

5. Cases of studies on issues related farm management
農業経営学に関連する研究の事例

1) Factors Affecting Technical Efficiency of Rice Farms in Nepal
稲作経営の技術効率に影響する要因に関する研究（ネパール）

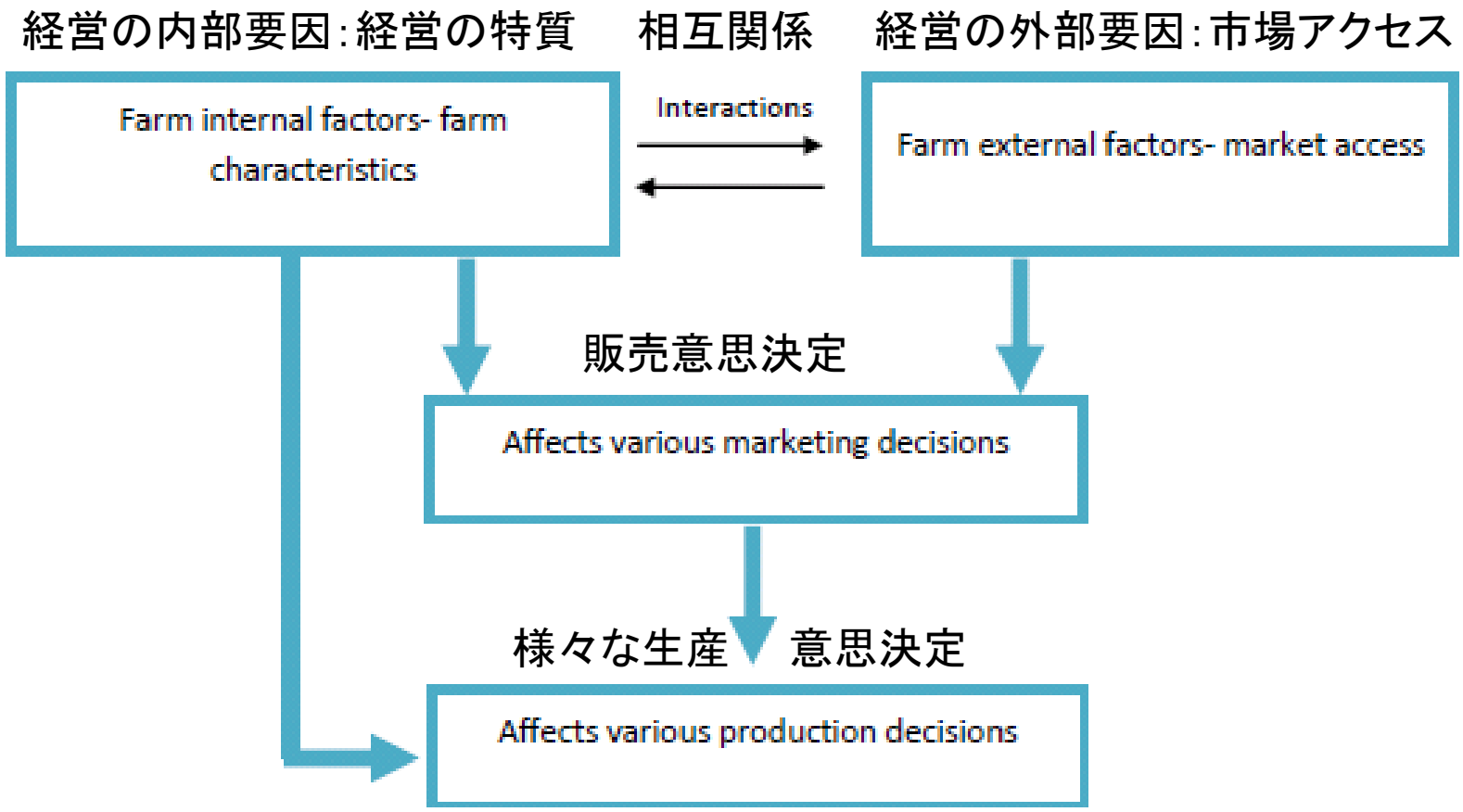


Figure　Production and marketing decisions
図　　生産・販売の意思決定

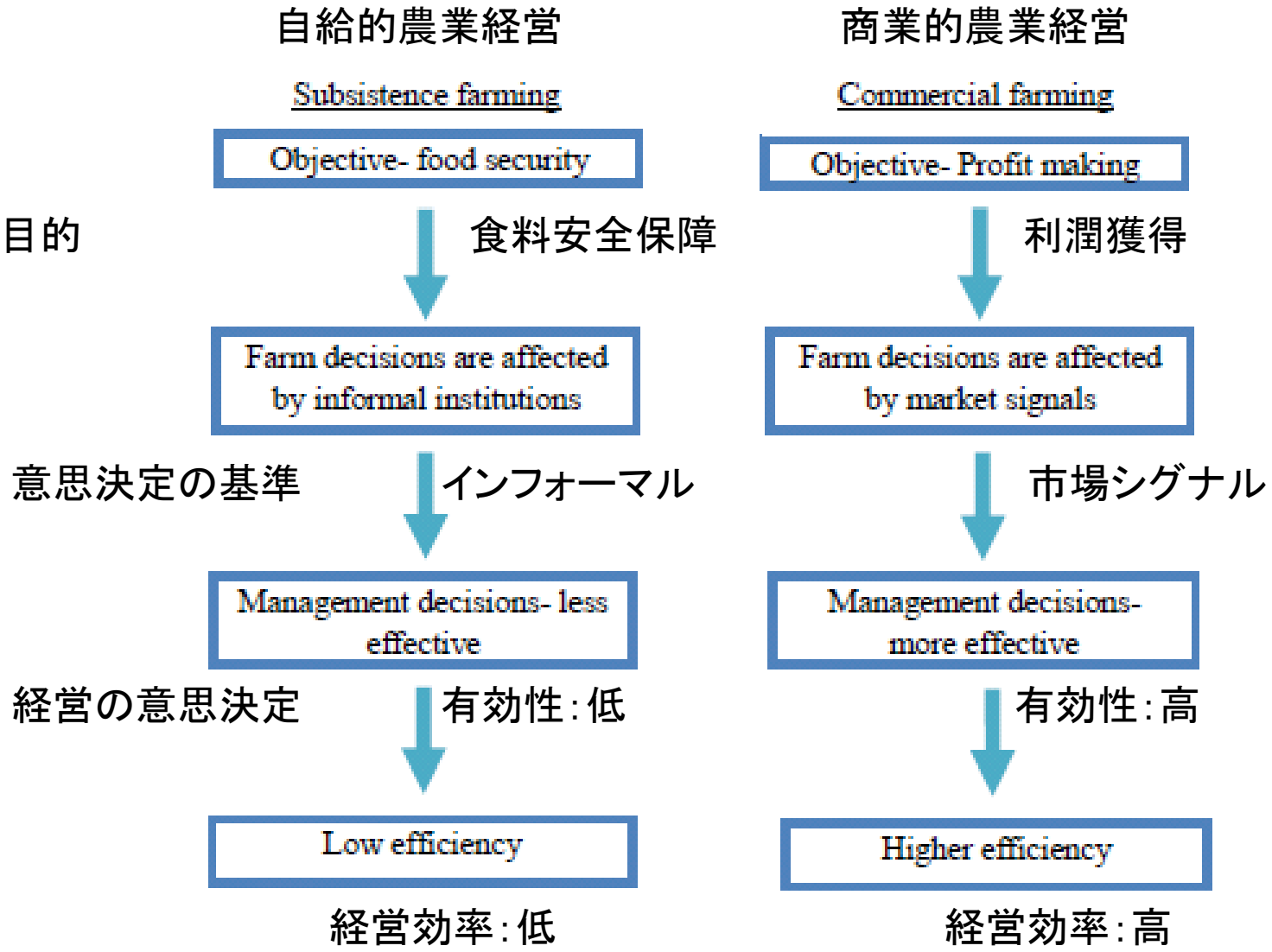


Figure Causal link between efficiency and the objective of farming
図 効率と経営目的との因果関係

Study Area

Chitwan and Dhading districts of Nepal.

Chitwan : one of the most potential districts in terms of agricultural production.

Dhading : at the middle of Kathmandu (capital of Nepal) and Chitwan. Chitwan is more urbanized and has better infrastructure compare to Dhading. Production zones in Dhading district are farther from the main urban centers.

調査地域

ネパールのChitwan地域とDhading地域

Chitwan : 農業生産地域の一つ

Dhading : KathmanduとChitwanの中間.

Chitwan はDhading よりも都市化が進み、インフラが整備されている。

Dhadingの農業地域は都市中心部より離れている。

Study Method

Data collection by households survey

Number of sample farms: 120 (60 for each district)

Measurement of efficiency by Stochastic Frontier Analysis (SFA) method

Analysis of factors affecting efficiency

研究方法

農家調査によるデータ収集

調査対象農家数：120戸 （各地区60戸）

確率的フロンティア分析法による効率の計測

効率に影響する要因の分析

Table Descriptive statistics of the input and output for the sample farms

District	Description	Unit	Mean	Standard deviation	Min	Max
Chitwan	Rice cultivated area	Katha	16.18	9.10	2	45
	Seed	Rs/katha	93.86	35.27	31.25	200
	Labor	Rs/katha	1054.52	331.35	260	2121.4
	Fertilizer	Rs/katha	161.81	62.17	60	356
	Pesticide + fungicide	Rs/katha	34.92	42.32	0	262.5
	Livestock	No/katha	0.23	0.16	0.01	0.82
	Productivity	Kg/katha	139.66	38.03	65	214.28
Dhading	Land	Katha	10.06	6.44	1.5	37.56
	Seed	Rs/farm	72.32	36.69	16.63	190.11
	Labor	Rs/farm	1363.64	671.92	133.03	4660.4
	Fertilizer	Rs/farm	155.01	112.29	0	466.66
	Pesticide + fungicide	Rs/farm	28.12	58.83	0	283.33
	Livestock	Rs/farm	0.60	0.55	0.08	3.05
	Productivity	Kg/katha	108.39	44.89	31.94	228.13

Source: Household survey, 2010

Table Production Function Estimates (Cobb-Douglas form)

Variables	Cross districts	Chitwan	Dhading
Land	0.61***	0.68***	0.53***
Chemicals (fertilizer, pesticide and fungicide)	0.22***	0.34***	0.16***
Seed	0.18***	0.07***	0.19*
Livestock	-0.008	0.02***	0.04
Labor	-0.11	-0.11***	-0.13
Const.	4.27	3.88	4.81
$sigma^2$	0.28	0.16	0.36
Lambda	5.02	1.26e+08	4.32

Note: *** represents significant at 1% level of significance

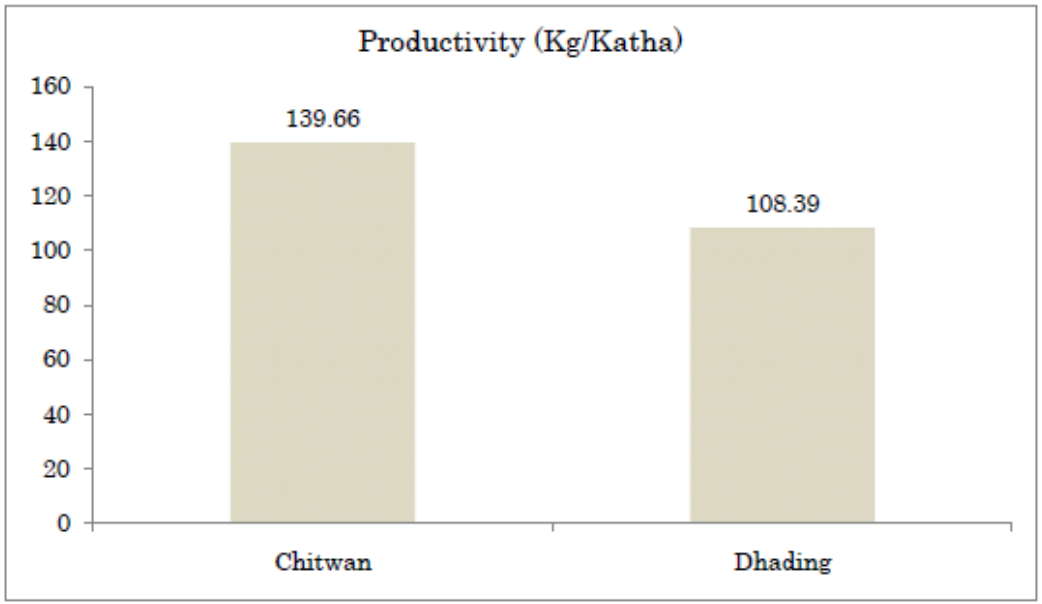


Figure Average rice productivity in Chitwan and Dhading

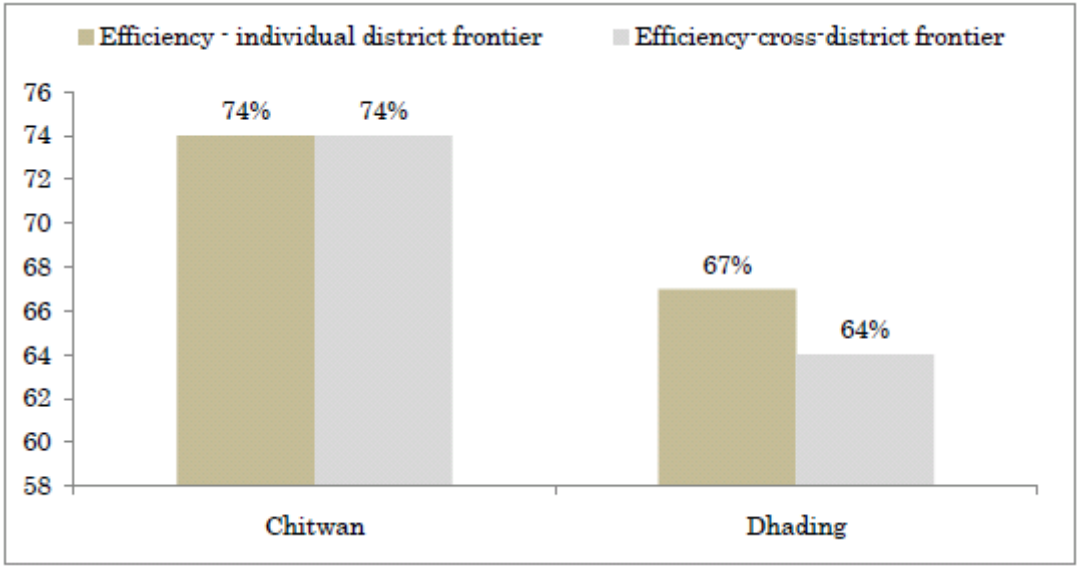


Figure Average efficiency in Chitwan and Dhading

Table Frequency distribution of farm-specific technical efficiency

Technical efficiency (%)	Chitwan (n=60)	Dhading (n= 60)
<30	0	4
30-40	0	4
40-50	3	5
50-60	6	10
60-70	15	12
70-80	12	11
80-90	14	10
90-100	10	4
Average	74	67

Table Factors affecting technical efficiency

Variables	Chitwan (Semi-Commercial area)		Dhading (Subsistence area)		Cross-districts	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Degree of commercialization	0.13***	0.08	-	-	0.17**	0.073
Education of HH head	-0.41	0.68	0.23	0.72	0.08	0.51
Highest education in family	-0.54	0.61	1.99**	0.92	0.40	0.54
Age of HH head	0.43**	0.17	0.25***	0.20	0.33*	0.13
Share of agricultural income in total income	0.39***	0.09	0.67***	0.12	0.52***	0.078
Cropping intensity	-0.001	0.02	0.015	0.03	0.01	0.01
Sharecropping	-0.30*	0.16	-0.021*	0.34	-0.33**	0.16
Constant	29.31	24.74	-21.93	18.03	4.16	11.64
F	5.13**		6.90***		11.60***	
R-Sq	0.40		0.45		0.41	
Adj R-sq	0.35		0.40		0.38	

Major findings

There is a remarkable gap in land productivity between two districts. The difference in input intensification, technical efficiency and technology are the main reason for difference in productivity.

The farmers residing in and near to urban areas have better economic opportunities in the form of market access compare to that residing in rural areas. This could be the plausible reason for higher technical efficiency in Chitwan.

Farmers residing in urban areas are benefitted by easy access to various production and marketing information.

主要な結論

両地区の間に土地生産性の著しい格差がある。

集約度、技術的効率性、技術の差が、生産性格差の主な理由である。

都市近郊の農家は、農村地帯の農家と比較して、市場アクセスに関して経済的機会に恵まれている。これが、Chitwanの高い効率性の原因と考えられる。

また、都市近郊の農家は、様々な生産・販売の情報に容易にアクセスできることによって恩恵を受けている。

Technical efficiency depends on various factors.

1) Higher level of commercialization increases technical efficiency. This means, a new technology would be capitalized more efficiently in the location where rice farming is relatively more commercialized.

2) Thus, agricultural development policy should focus not only to the technological enhancement but also give equal importance to transform the subsistence agriculture to commercial one.

3) The result indicated that four household characteristics are important namely age of household's head, share of agriculture income to total household income, education of household members and land tenancy system.

技術的な効率はさまざまな要因に依存している。

1）商業化の向上は技術的な効率を向上させる。このことは、より商業化した地域の稲作において、新技術は効率的に定着することを意味する。

2）したがって、農業開発政策は、技術の向上だけでなく、自給的農業を商業的農業に転換することに重点を置く必要がある。

3）農家の特性では、世帯主年齢、農業所得依存度、世帯員の教育水準、借地形態が重要であることが示された。

2) Innovation, cooperation and business performance

: Some evidence from Indonesian small food processing cluster

イノベーション・連携と経営成果

:インドネシアの小規模食品加工業クラスターの分析結果

Purpose : To understand

① the cooperation activities of small and medium enterprises (SMEs) in food processing industry clusters

② the role of cooperation in improving innovation

③ the relationship between cooperation, innovation, and business performance of SMEs in food processing industry clusters in rural areas.

目的:以下の3点を明らかにする

①中小食品加工業クラスターにおける連携行動

② イノベーションにおける連携行動の役割

③ 農村の中小食品加工業クラスターにおける連携、イノベーション、経営成果の関係

Methods:

An empirical survey was conducted on SMEs in food processing industry clusters. Primary data collected in five SMEs clusters were analyzed by regression and correlation analyses using the path-analytic approach.

Hypotheses:

Cooperation is positively related to innovation.

Innovation of SMEs is positively related to business performance.

方法:

食品加工産業クラスターの中小企業に対する実態調査。

5つのクラスターで収集された一次データを、回帰分析やパス解析を用いて分析。

仮説:

連携行動はイノベーションに寄与する。

イノベーションは中小企業の経営成果に寄与する。

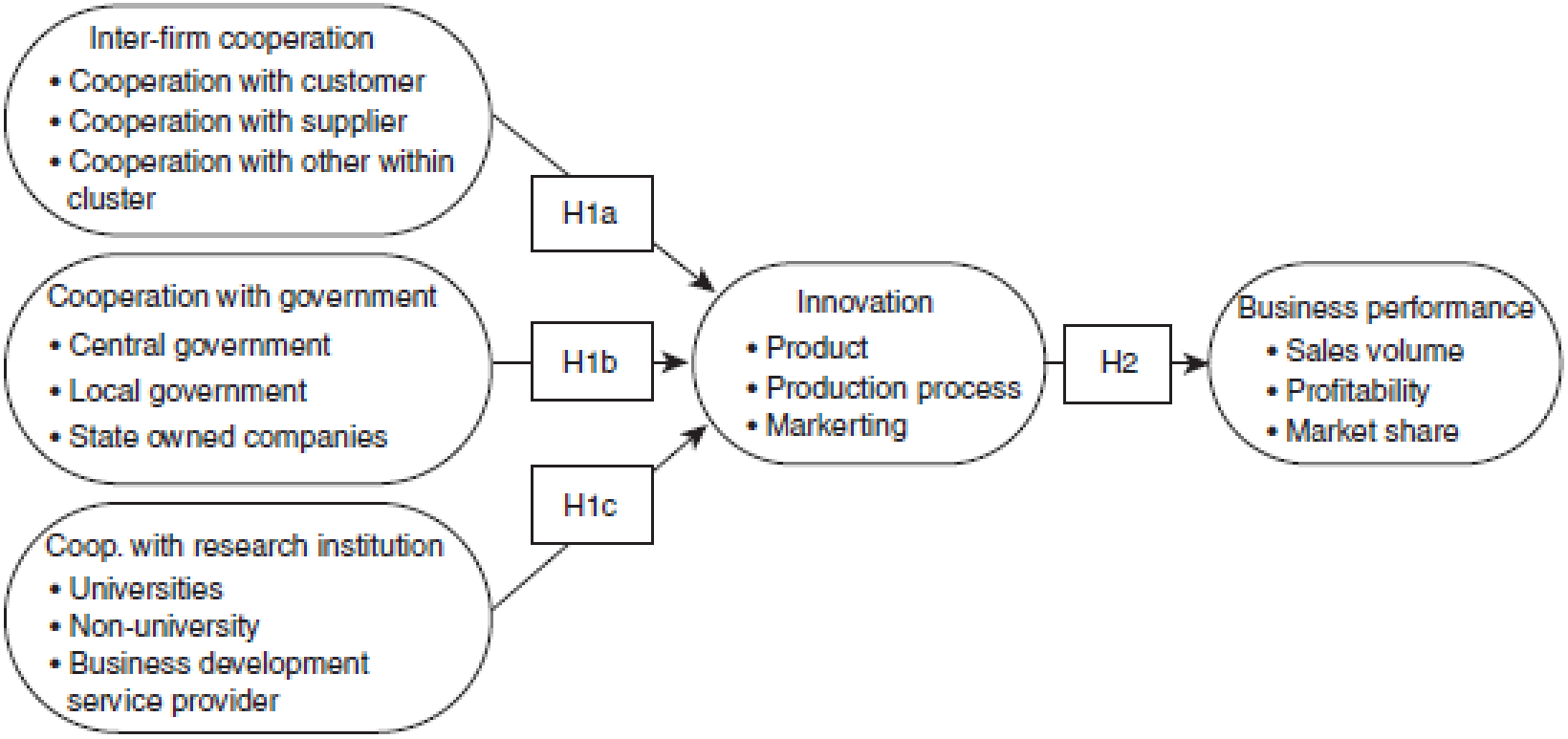


Figure Model of relationship between cooperation, innovation and business performance

Table Location and type of cluster

Location	Type of cluster	Number of respondent
Pangalengan District	Milk	25
Cianjur District	Emping melinjo crackers	30
	Processed fish	17
Bandung District	Tempe	22
	Tempe chip	9
Bogor District	Tapioca flour	13

Table Demographic and organization characteristics

Characteristics	Frequency	Percentage
Total number of employees		
5-10	32	19.1
11-20	101	60.5
21-40	23	13.7
41-70	11	6.7
71-99	0	0.0
Education level of manager/owner		
Elementary school	38	22.8
Junior high school	52	31.1
Senior high school	66	39.5
College	9	5.4
University	2	1.2
Annual sales		
< Rp 200 millions	53	31.8
Rp 200 millions to Rp 700 millions	62	37.1
Rp 700 millions to Rp 1 billion	31	18.5
Rp 1 billion to Rp 5 billions	14	8.4
Rp 5 billion to Rp 10 billions	7	4.2
Length of operation (years)		
< 5	26	15.6
5-10	30	17.9
10-15	55	32.9
15-20	33	19.8
⩾ 20	23	13.8

Table Benefit from inter-firm cooperation

No.	Benefit	Number	%
1	Reduce cost of raw material	123	74
2	Access to market	87	52
3	Share of equipment	56	34
4	Share of information and knowledge	74	44
5	Innovation development	51	31

Notes: Respondents could answer more than one choice
The numbers refer to the number of respondents giving a response; total $n = 167$

Table Benefit of cooperation with government and research institution

		Institution			
		Government		Research institution	
No.	Benefit	Number	%	Number	%
1	Financial support	125	75	13	8
2	Access to market	102	61	47	28
3	Managerial development	77	46	119	68
4	Technological development	80	48	68	41
5	Innovation development	55	33	105	63

Notes: Respondents could answer more than one choice
The numbers refer to the number of respondents giving a response; total $n = 167$

Table Motivation for innovation, sources, and area of innovation

	Number	%
Motivation for innovation		
Commercial developments	99	59
New product ideas and developments	31	19
Financial rewards	37	22
Competitor action	115	69
Personal satisfaction	12	7
Sources of innovation		
Internal R & D	15	9
Government	45	27
Research institution	32	19
University	53	38
Customers	112	67
Competitors	101	60
Supplier	97	58
Area of innovation		
Product	125	75
Production process	56	34
Marketing activities	114	68
Packaging	127	76

Notes: Respondents could answer more than one choice
The numbers refer to the number of respondents giving a response; total $n = 167$

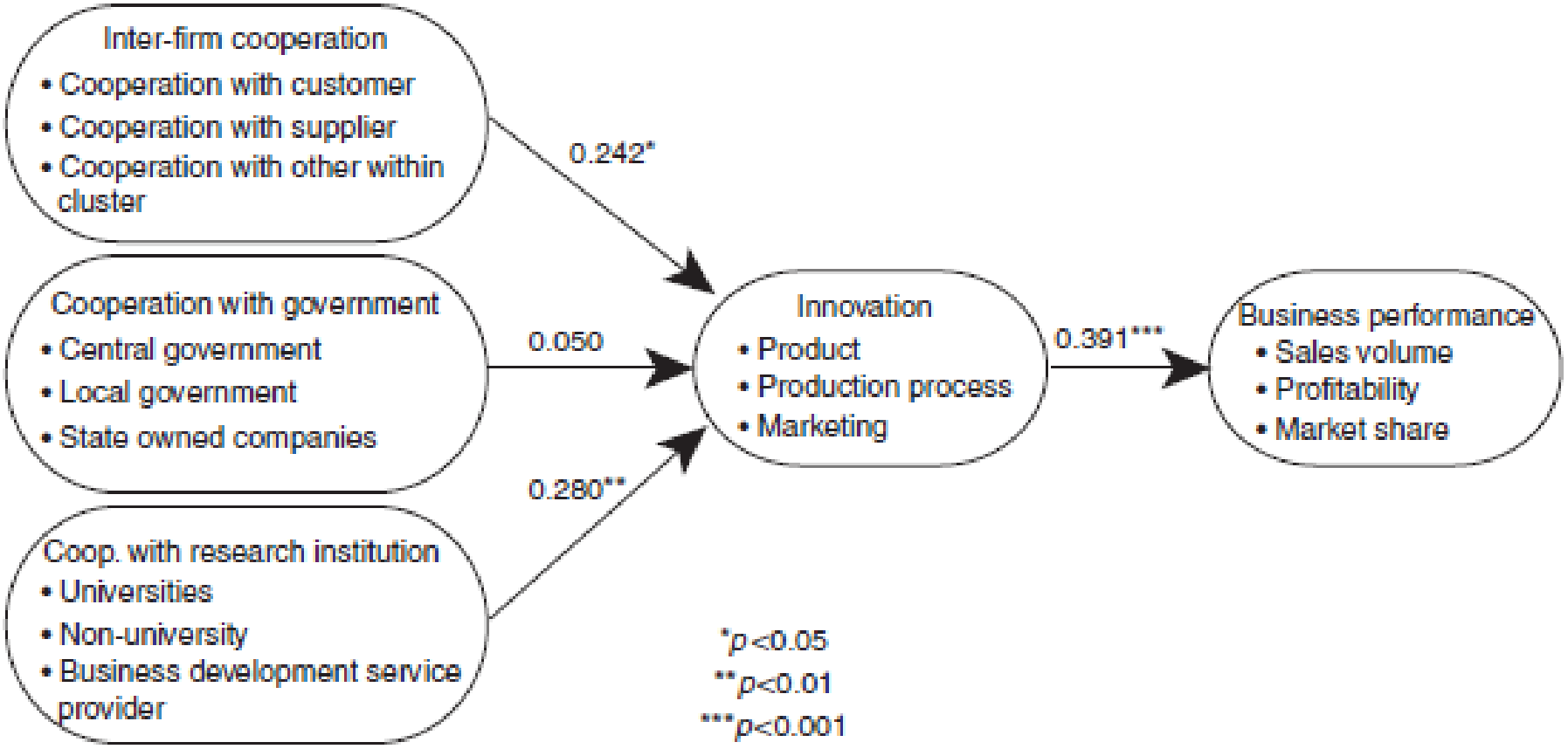


Table The result of path analysis

Conclusion 結論

The results of this study indicate the importance of cooperation, specifically inter-firm cooperation and cooperation between SMEs and research institutions, in the development of innovation in SMEs in food processing industry clusters.

Since no correlation was found between cooperation with government and innovation, government should consider another role in supporting the innovation of SMEs.

分析結果は、食品加工産業クラスターにおける中小企業のイノベーションの発展における連携の重要性、とくに企業間の連携と企業と研究機関との連携の重要性を示している。

政府との連携については、イノベーションとの関係は認められなかったことから、政府は中小企業のイノベーションを支援する上で別の役割を検討する必要がある。

Although cooperation with research institutions has a pronounced influence on the innovation of SMEs, SMEs consider their consumers and competitors the main sources of their innovations, not the research institutions.

The results of this study show significant relationships between the innovations of SMEs and the business performance of the firms. Therefore, it can be concluded that adopting innovative practices tend to generate competitive advantages and lead to better business performance for SMEs.

研究機関との連携は、中小企業のイノベーションに顕著な影響力を持っているものの、中小企業は研究機関ではなく、消費者や競合他社がイノベーションの主な発生源と考えている。

中小企業のイノベーションと経営成果の間には有意な関係がある。したがって、それは採用する革新的行動が競争優位を生成し、中小企業の経営成果を高める効果があると結論付けられる。

3) Choice of Contract Farming and its Impact on Agricultural Income

: A case of Vegetable Production in Bac Giang, Vietnam

契約農業の選択が農業所得に与える影響：ベトナムBac Giangにおける野菜生産の場合

Purpose: To clarify following questions.

①How do the farmers participate in the contract farming in vegetable production in Bac Giang Vietnam?

②What are the main factors influences on the contract choice of farmers?

③Does the contract choice affect on the farmer's agricultural income?

目的：以下の点を明らかにする。

①ベトナムBac Giangの農家は、いかにして野菜生産の契約農業に参加するのか？

②農家の契約選択に影響する主要な要因は何か？

③契約選択は、農家の農業所得に影響するか？

Table Vegetable production and contract farming in Bac Giang

Vegetable cropping and contract	Lang Giang	Son Dong	Total
Households Non-crop vegetable	1	7	8
Households crop vegetable without contract	6	0	6
Households crop vegetable with contract only	2	17	19
Households crop vegetable with contract and without contract	18	0	18
Total	27	24	51

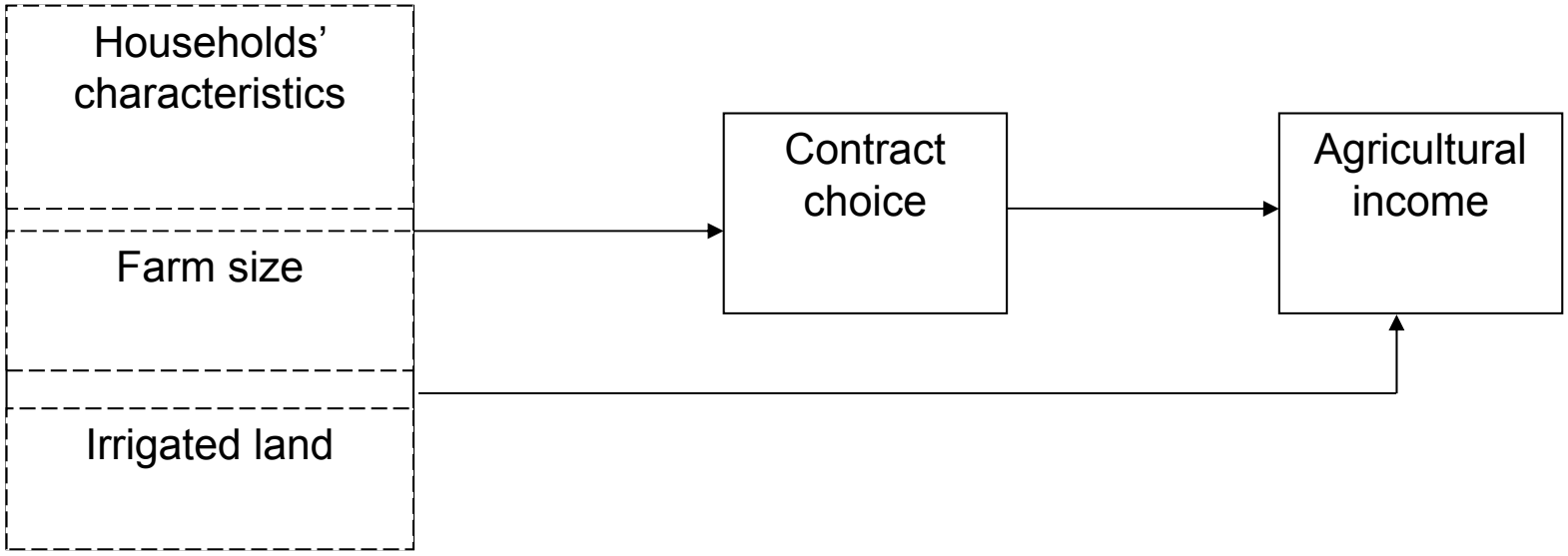
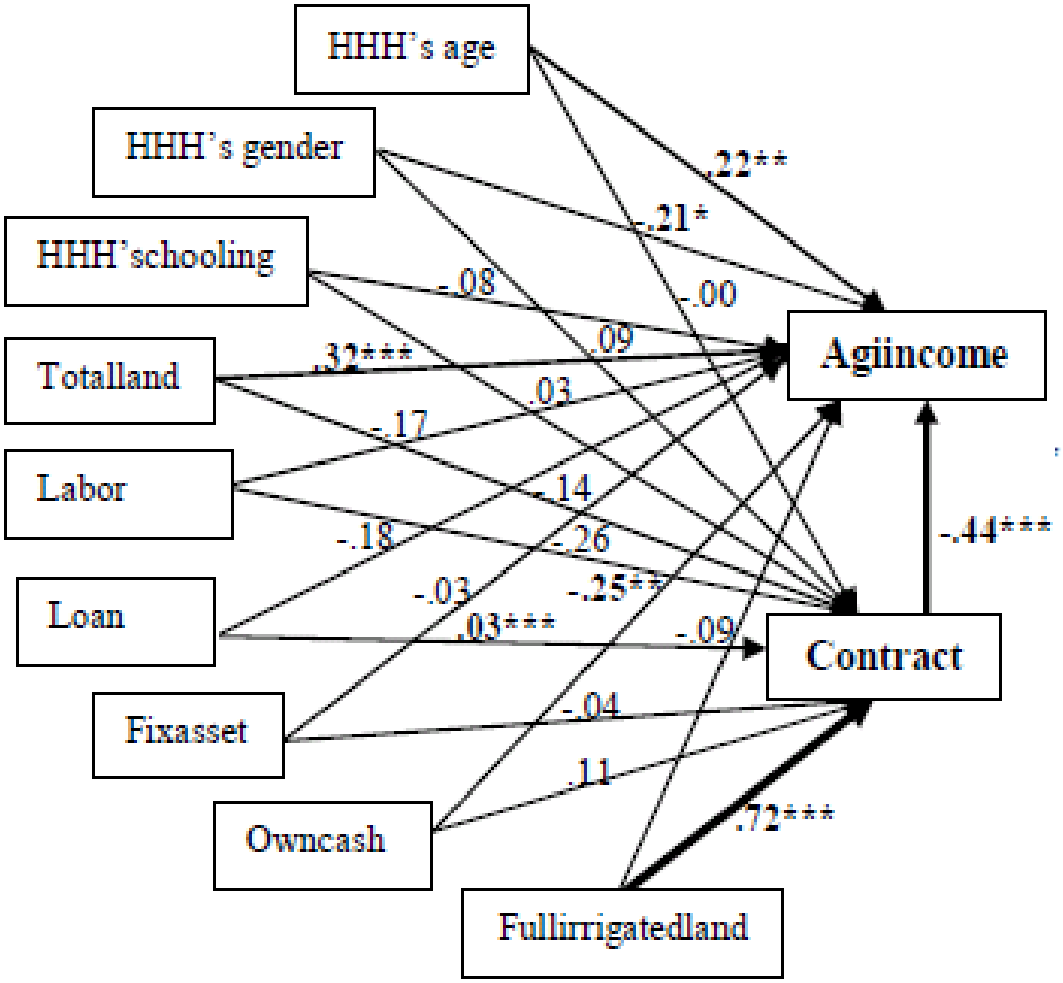


Figure Concept Model of Factors Affecting Contract Choice and Agricultural Income

Table Definition of Variables

Variables	Indicated by	Variables	Indicated by
1.Age of household's head (HHH's age)	Year	6.Total labor (Totallabor)	Number of persons who are from 16- 60 year old
2.Gender of household's head (HHH's gender)	Male/Female	7.Total land (Totalland)	Cultivated land + Resident land + land of Livestock +Other land
3.Education of household's head (HHH's schooling)	Year of schooling	8.Fullirrigated land (Fullirrigated land)	Proportion of the land is controlled by good irrigation system
4.Loan (loan)	Total money borrowed from the bank and other sources until survey time	9.Contract (contract)	Yes/No Choice
5.Agricultural income (Agiincome)	Sale – Cost (Fertilizer, pesticide, seedling, renting, feeding, and veterinary)	10. Fix asset (Fixasset)	Value of all asset owned by household including: Buffalo, Cows, Motorbike, Bicycle, Pump, House, Television, Machines
11.Owned cash (Owncash)	Cash owned by household annually to cover for daily life and production cost		



			β	*P* value
Contract choice	<---	Fullirrigatedland	0.717	.000
Contract choice	<---	Owncash	0.104	.240
Contract choice	<---	Fixedasset	-0.041	.642
Contract choice	<---	Loan	0.243	.006
Contract choice	<---	Labor	-0.026	.786
Contract choice	<---	Totalland	-0.142	.139
Contract choice	<---	HHH'schooling	0.026	.785
Contract choice	<---	HHH's gender	0.089	.350
Contract choice	<---	HHH's age	-0.004	.969
Agriincome	<---	HHH's age	0.219	.047
Agriincome	<---	HHH's gender	-0.212	.057
Agriincome	<---	HHH'schooling	-0.084	.447
Agriincome	<---	Totalland	0.317	.005
Agriincome	<---	Labor	-0.170	.124
Agriincome	<---	Loan	-0.175	.140
Agriincome	<---	Fixasset	-0.026	.811
Agriincome	<---	Owncash	-0.254	.023
Agriincome	<---	Fullirrigatedland	-0.088	.601
Agriincome	<---	Contract choice	0.443	.007

***; **; * Significant at 1%; 5% and 10% level respectively

Figure Path diagram of estimated model

Conclusion and Policy Implication　結論と政策的含意

Contract choice brings farmers more income.

The policies of government to promote the participation of farmers in the contract farming should be continued for achieving the goal of poverty reduction in rural development process.

But it should be considered about the factors affect to the crop choice.

It indicates that full-irrigated land is main factor affect to households' contract choice in growing the contract crops.

From this point, the investments into the irrigation system should be encouraged from government, companies and farmers.

契約農業の選択は農家により多くの収入をもたらす。

農家の契約農業への参加を促進する政策は、農村開発における貧困削減の目標を達成するために継続すべきである。

しかし、作物選択に影響する要因の考慮が必要。灌漑整備が主な要因は、契約作物の栽培における農家の契約選択に影響することが示されている。

この点から、灌漑システムへの投資は、政府、企業、農家において奨励されるべきである。

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