Classification criteria and commercial profile re-definition of the Family Farm Agriculture in Chile, Maule region

Criterios de clasificación y re-definición de un perfil comercial de la Agricultura Familiar Campesina, Región del Maule, Chile

Roberto Jara-Rojas   Paula Manríquez
José Díaz Osorio   Álvaro Rojas

ABSTRACT

In Chile, small-scale farmers are classified according to old approaches from 1993 that do not include changes occurred in the last two decades. Maule is the region with most rural population in Chile which represents a significant stratum for development, innovation and competitiveness. This study explores a new approach of small-scale farmers -associated with Family Farm Agriculture (AFC) - classification in Chile and it describes a commercial profile or AFC-1 for famers of the Maule Region. A Cluster analysis to determine AFC-1 farmers is used. The analysis includes four association variables: Total Assets, Farm Income, Production Costs and Management Indicators. The results suggest that 16.4% of the farmers have a commercial profile and they could stay out support provided by the National Institute for Agricultural Development (INDAP). This group of farmers would not belong to AFC in short terms. This fact could bring restriction to AFC-1 farmers such as lack of credit access, less investment incentives and technical assistance. Thus, it would expect low process of technology adoption and welfare improvement. New agrarian policies must be warranted to support this important group of famers with a commercial profile.

RESUMEN

El pequeño productor en Chile es clasificado de acuerdo con criterios que datan desde 1993, los que no incorporan los cambios producidos en el medio rural en las últimas décadas. La Región del Maule concentra la mayor proporción de población rural de Chile, lo que representa un estrato significativo para las estrategias de desarrollo, innovación e inserción competitiva. En este estudio se exploraron nuevos criterios de clasificación del pequeño productor asociado a la Agricultura Familiar Campesina (AFC) en Chile, definiendo un nuevo perfil comercial con énfasis en agricultores de la Región del Maule. El perfil comercial se determinó a través de un análisis cluster considerando cuatro criterios de clasificación: Activos Totales, Ingreso Agrícola, Costos de Producción y un Indicador de Gestión. Del análisis se desprende que un 16,4% de los agricultores posee perfil comercial (AFC-1) y podría dejar de cumplir los requisitos establecidos por la Ley para ser usuarios del Instituto de Desarrollo Agropecuario (INDAP). En el corto plazo no serían parte de la AFC, lo que presentaría ciertas restricciones y factores que limitan la competitividad de este importante segmento, tales como el acceso al crédito, inversiones y asistencia técnica. Dichas variables son clave en procesos de adopción de nuevas tecnologías y mejoramiento del ingreso agrícola y, por lo tanto, posibilitan la permanencia en esta actividad económica. Políticas agrarias eficientes deben ser consideradas para continuar apoyando a este grupo de mayor capacidad empresarial.

Dpto. de Economía Agraria. Facultad de Ciencias Agrarias. Universidad de Talca. 2 Norte 685 Talca. Chile. Casilla 747. rjara@utalca.cl

INTRODUCTION

Maule Region is the area that concentrates a higher proportion of rural population[1] in Chile (35.5%). Along with this, of the 55,000 farms that are estimated in the Census of Agriculture 2007 (13), 93% of them have an area between 0.1 and 15 hectares (ha) equivalent (HRB)[2]. The range described above concentrates 55% of regional land resource (3 million ha are equivalents to 245,000 HRB) (13). The Family Farm Agriculture (AFC) of the Maule Region accounts for 16% of the total national, which represent a stratum significant in any agricultural development strategy and competitive positioning, not only in response to the effects on the stratum itself, but also for the overall welfare effects that result from better utilization of available resources.

According to Calus and Van Huylenbroeck (4), a definition of family farming includes the following elements: both business ownership and management control belong to family members or close to it; the business and management control are transferred within the family through successive generations; most labor is provided by the head of the household and his family; an important part of capital has been provided by the farmer and his family, the family gets an important part of their income from agriculture and the family lives in farm.

FAO (8) explains the criteria used to define small-scale agriculture according to the number of HRB: for a mini farm having an area less than 2 HRB, and peasant properties ranging in size from 2 to 12 HRB. In Chile, small-scale agriculture presents heterogeneous levels of integration into local markets and low direct participation in international markets. Furthermore, a study by ODEPA (18) classifies AFC in small-scale business and subsistence farming. The main differences between the groups is the farm size, natural and physical capital of the subsistence farming that cannot achieve a minimum income, defined for that year by approximately US$ 2,200 annually.

The National Institute for Agricultural Development (INDAP) is the main agency providing support to AFC. INDAP was created in 1962 and its mission is to increase the competitiveness of small-scale agriculture. Actually the extension coverage includes more than 100,000 farmers, this means three times more than in 1990 (12). The INDAP role -as an agent of change and transformation of small-scale agriculture- has a strong

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1 In Chile, the concept of rurality is defined by UNDP (20) as those settlements despite are statistically urban or non-rural according to demographic official definition, are still functional to economic activities that are typically rural: agriculture, fishing, forestry or livestock.

2 In Chile, a Hectare Basic Equivalent or HRB is the area equal to the potential of producing a physical hectare, irrigated class one (I) for use capacity in Maipo River Valley. To determine the total HRB for each producer, you must multiply the total physical by the different conversion factors that apply, as a "Table of Equivalent Hectares Irrigation Physics Basic".

reputation not only among farmers but also in the community of professionals involved in the agricultural sector. The legal framework of the Law of INDAP corresponds to an interpretation of the phenomenon of family farming in post - land reform. Despite the amendments made thereafter, prevails is the existence of a traditional family farmer oriented to domestic markets, limited in his income and with a limited production scale to the current demands of specialization.

Moreover, INDAP has a hierarchical organizational model, with limited space for effective management and regional innovation. It is not legally guaranteed the participation of users in the strategic direction of the institution, or in supervising the operation of programs. The effort of the institution to promote the development of family farmers is strongly limited by the legal profile of the user or beneficiary of INDAP. Specifically it is quite difficult that INDAP maintain the support to those farmers who have achieved positive results resulting from the application of different instruments and without INDAP assist they could not have autonomy to continue its development.

This aforementioned leads to establish well-defined user profiles, which require different development instruments that have not been clearly established yet, being farmers that already established effective links with the various channels food nationally and internationally (5). According to Diaz (6) the AFC can be classified in different categories. Among these stands out the AFC-1 stratum, whose main characteristics are related to those producers who come from the land reform process or land settlement. This group of farmers has been successful in managing their businesses capitalizing the farm (machinery, productive infrastructure, new technologies), and they have been acquiring new land over time, expanding their properties. Thus, the phenomenon known as "graduation" of the system implies that AFC-1 farmers have exceeds the typical user of INDAP. They are generally entrepreneurs and innovative farmers, with high-capacity of management and strongly oriented to domestic or international markets.

INDAP beneficiary profile is described in the Organic Law of 1993 (11), and that not fully incorporates the changes that have occurred in the most emerging families farming in recent decades, due to the typical changes of a developing society, and the implementation of public policies in the agricultural sector. The definition of "small-scale farmer" is based on a combination of four variables applicable to the family production unit and / or its owner: a) work directly the land, whatever their tenure, b) operate an area no greater than 12 HRB, c) hold assets in an amount not exceeding the 3,500 UF[3] and d) the family income come primarily from the farm.

Given the "un-upgrade" definition of small farmers, associated with the AFC, it is necessary the application of new concepts, definitions and experiences, based not only on the international condition, but also in the situation of the country that allow the use of the potential economic, technological and productive that AFC farmers have.

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3 The Unidad de Fomento (UF) is a measure based on the indexed change in the Consumer Price Index. Its value at April 18, 2011 is $ 45.8. (1US $ = $ 472.5 Chilean Pesos).

Thus, it is necessary to investigate other variables that could represent a more applicable characterization of the AFC. An important issue is to design new instruments[4] of policy that reflex the current status of the small-scale farmers with commercial-oriented profile.

The aim of this research is to explore new approaches to classification of the AFC in Chile, defining a commercial profile (AFC-1), focusing on the case of small-scale farmers in Maule region. The rest of the article is organized as follows: Materials and Methods section that mentions the study area and give details of the methodology used. Next, we present the main results and discussion. Finally, we discuss conclusions and policy implications derived from the results obtained.

MATERIALS AND METHODS

Study area and data

The target group using in this research are farmers from the AFC of the Maule Region (figure).
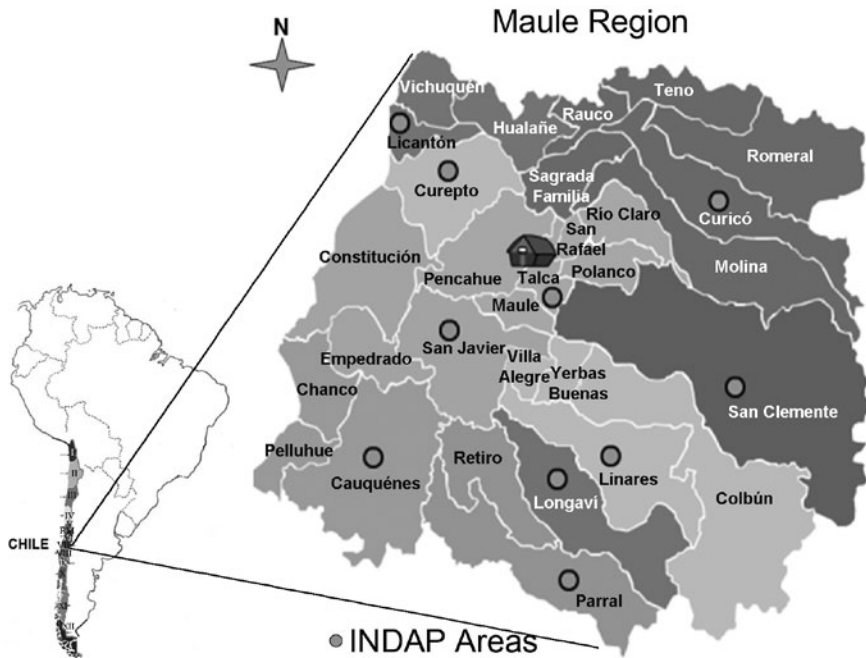

Figure. Map of the Maule Region and INDAP Areas.
Figura. Mapa de la Región del Maule y áreas de INDAP.

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4   The mission of INDAP is to generate skills and support to actions promoting sustainable development of AFC in Chile. Under this context INDAP has seven service lines (Irrigation, Soils, Land Development, Extension, Investment, Agricultural Items and Credit). Every service has development tools that benefit small-scale farmers defined by INDAP in its Law.

According to information provided by INDAP, during the agricultural season 2007/08, 3913 surveys were made in production units in the region, which is considered as the universe in this study (U). All production units are covered by the program of Technical Assistance Service (SAT). INDAP performed a questionnaire called "Diagnostic Business Unit Farm SAT"[5]. The main items included were sheep/cattle, beekeeping, vegetables, cereals (mainly rice and corn) and berries.

The survey has two sections. Section 1 shows the general background of the SAT user small-scale farmer, household composition; general background of the farm; farm income and availability of labor; factors of production, financing and agricultural emergencies. Section 2 includes a description of the business and target market, margin of business unit (Total revenue for the 2007-2008 season by type of product, total production costs, gross margin) and critical points that affect competitiveness (*e. g.* productivity, quality, management and partnership, use of INDAP support instruments, among others).

METHODOLOGY

The surveys were completed during the agricultural season 2007/08. A sample of the universe was computed according to the following equation (10):

$$n' = Z^2_{\alpha/2} \frac{p(1-p)}{d^2} \qquad [1]$$

where Z is the normal distribution and its value is calculated assuming 95% of error (α = 0.05), p is the maximum probability of success (0.5) and d is the precision, maximum permissible error in terms of proportion (0.05). According to equation [1] the sample size is 385 surveys. This result was corrected using equation [2]; thus, the sample size (n) is given by:

$$n = \frac{n`}{1 + n`/U} \qquad [2]$$

where U is the universe (3,913 SAT Surveys), therefore, the final sample size are 350 surveys. In order to avoid possible errors associated with the survey field interviews and subsequent typing, a slightly higher sample size of 359 surveys was considered. In addition, the sample size was set proportionally to the areas of INDAP and their crops through the proportional allocation method. This stratified sampling is the prior division of the population into groups or classes that are assumed as homogeneous (17, 24). Escobar and Berdegué (7) added that stratification is a technique that involves subdividing a heterogeneous population into more homogeneous strata. Table 1 shows the stratification of the final sample.

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5 The Technical Assistance Service (SAT) is a service of INDAP that provide technical support to farmers and help them to improve their production systems over time, through best management practices and management of all production factors involved. The program targets farmers INDAP defined "operationally" as Farmers with Commercial Profile.

We used homogeneous groups or clusters in order to analyze those farmers with commercial profile. The following variables of association were considered: a. Total Assets: Assets that farmer declares in UF (one of the criteria used at present). b. Agricultural income: the value of Agricultural Production in US$ in 2007/08 season (1US $ is equal to $ 472.5 Chilean). c. Production Costs: Value of inputs, hired labor and valued family labor, machinery and other costs in US$ directly associated with production.

Table 1. Sample Stratification by INDAP area and crops item.
Tabla 1. Estratificación de la muestra por área INDAP y Rubro.

INDAP area	Item	Universe	Sample
Cauquenes	Group 1: Strawberries / Berries	199	18
	Group 2: Ovines	62	6
Curepto	Group 1: Beekeeping	45	2
	Group 2: Ovine / Bovine	83	8
	Group 3: Vegetables / Flowers	42	4
Curicó	Group 1: Berries	141	13
	Group 2: Bovines	52	5
	Group 3: Vegetables (annual)	38	4
	Group 4: Vineyards	50	5
	Group 5: Fruits, Berries	39	4
Licantén	Group 1: Beekeeping	42	2
	Group 2: Bovine / Ovine	32	2
Linares	Group 1: Beekeeping	45	4
	Group 2: Berries	248	22
	Group 3: Bovines	79	7
Longaví	Group 1: Beekeeping	40	3
	Group 2: Rice	40	4
	Group 3: Berries	96	9
	Group 4: Bovine / Ovine	41	4
Parral	Group 1: Beekeeping	40	3
	Group 2: Rice	319	26
	Group 3: Berries	611	58
	Group 4: Bovines	90	11
San Clemente	Group 1: Beekeeping	70	6
	Group 2: Berries	243	23
	Group 3: Bovines	95	9
	Group 4: Vegetables	236	23
	Group 5: Vegetables/Flowers	36	3
San Javier	Group 1: Berries	40	4
	Group 2: Bovine /Ovine	40	4
	Group 3: Vegetables	60	6
Talca	Group 1: Berries /Apples	56	5
	Group 2: Bovines	67	6
	Group 3: Vegetables (green house)	168	16
	Group 4: Vegetables	328	30
Total		**3913**	**359**

The grouping variables described above were classified by hierarchical clustering (dendrogram) and then homogeneous groups were performed using the K-means algorithm (9, 25).

In adittion, we used "Management Indicators", which corresponds to a single group of producers as if you have start-up (Legal registry in the national revenue service SII), if they keep records of income and expenditure and if they keep records of production. Each indicator is equivalent to a point.

RESULTS

Farmers general characteristics

Globally, the predominant production system is the cultivation of berries (blueberries, blackberries and raspberries) explaining 44% of total farms. 21% of the area is cultivated by vegetables and 17% by livestock; annual crops represent 10% of the production systems of the sample. Beekeeping and vineyards represents 7% and 1% of the sample respectively.

The Maule region has 10 INDAP defined areas (figure, page 144). Cauquenes area represents 6.7% of the universe and the most important sectors are strawberries and ovine. The area of Curepto represents 4.3% of the universe and the main productive systems is beekeeping, ovine, cattle, vegetables and berries. The area of Curicó explains 8.2% of the total and its main items include berries, beekeeping, annual vegetables, vineyards and cattle. The Licantén area represents only 1% of the sample and the items considered are beekeeping and ovine. 9.5% of total SAT surveys are in the area of Linares, in this area the items include beekeeping, rice, berries and livestock. The area of Longaví explains 5.5% of the universe and the main items are similar to the area of Linares. Parral area represents 27.1% of total farmers being the major area in the study; the main items are berries, rice, beekeeping and cattle.

San Clemente is the second largest area of SAT diagnostic representation of the study, this area accounts for 17.4% of the total and the main items involved are beekeeping, berries, bovine, vegetables and flowers. Finally, San Javier and Talca represents 3.6% and 15.8% of the total, respectively.

Human capital characteristics

One of the variables related to human capital is education; 3.8% of the farmers have not education, 40% of farmers have incomplete elementary education, 8.4% had completed high school and only 3.5% have technical or higher education studies. The average age of farmers is 51 years, with rates ranging from 26 to 77 years.

Similar results for human capital variables are shown in Jara-Rojas *et al.* (14) using a sample of small-scale farmers in Maule region. 80.4% of the head of household are male and 19.6% are women. The average number of people living in the home of the farmers in the sample is 3.7, with a maximum of seven members.

Regarding to farm income, on average, farmers receive $ 13,970 USD per year. A small group of farmers do not declare incomes and the maximum farm income is U.S.$103,500 (see Table 2). On average farm incomes are higher in vegetables (U.S. $22,224), followed by annual crops (U.S. $21,081); the vineyards with U.S.$ 13,250 and berries with U.S.$ 12,233. The livestock production and beekeeping properties are the ones with lower farm income.

Table 2. Socioeconomics and productive statistics of the sample.
Tabla 2. Estadísticas socioeconómicas y productivas de la muestra.

Variables	Unit	Mean	Standar Deviation	Min.	Max.
Age	years	51	14	26	77
Education level	percentage				
No studies		3.8%	-	-	-
Elementary Incomplete		39.8%	-	-	-
Elementary Complete		27.2%	-	-	-
High school Incomplete		8.4%	-	-	-
High school Complete		17.2%	-	-	-
Higher Education		3.5%	-	-	-
Gender	percentage				
Male		80.4%	-	-	-
Female		19.6%	-	-	-
Family size	members	3.7	1.3	1	7
Farm Income	US$*	13.970	15.027	0	103.500
Farm Size	Ha	10.1	26.2	0.1	400
Start-up	percentage	73%	-	-	-
Assets	UF*	1.118	1.649	4.6	14.111
Access to Credit	percentage	41%	-	-	-
Incentives	percentage				
SIRSD		21%	-	-	-
PDI		16%	-	-	-
Irrigation programs		1%	-	-	-
Other programs		17%	-	-	-

* (1US$ = $ 472.5 Chilean) 1 UF = US$ 45.8.

* (1US$ = $ 472,5 Pesos Chilenos) 1 UF = US$ 45,8.

Description of the assets

The mean of the assets reported is UF 1,118, ranging from a minimum of 4.6 UF and a maximum of UF 14,111 (table 2). The assets considered in the survey were: machinery and equipment, vehicles, irrigation water, irrigated land area, dryland area, animals, plantations, construction, hives and others. Farmers whose main crops are the vineyards have higher assets (UF 2,742).

In contrast, beekeeping and vegetable farmers are those with the least amount of assets (554 UF). An important aspect is that 6.6% of the sample declared assets worth more than 3,500 UF and do not complete one of the requirements to be INDAP beneficiaries.

Use of instrument for development

Table 3 shows the use of INDAP instruments according to productive orientation. 63% of the sample farmers received at least one of the main instruments given by INDAP. 41% of the sample has received credit, either short or long term. Credit plays an important role generating more capital assets and increasing production. Also, credit improves the efficiency, productivity and returns on investment, diversify sources of income and increases employment (1). In Chile, the formal financing of small-scale farmers is performed in 90% of the cases by INDAP (15).

Regarding to the use of other instruments, 21% of farmers of the sample have received "System of Incentives for Recovery Degraded Soils"[6] (SIRSD). This program consists of financial assistance, non-refundable, designed to co-finance those activities and practices aimed at recovering degraded agricultural land and/or maintaining the fertility of agricultural land by the implementation of practices that prevent erosion and loss of natural fertility (24). This instrument is a fundamental tool in the recovery of soils, based on the evidence of the relationship between productivity, erosion and rural poverty (16, 19, 21, 23).

Table 3. INDAP Instrument use by productive system.
Tabla 3. Uso de instrumentos INDAP según sistema productivo.

Productive Systems	INDAP Instruments				
	Credit	SIRSD	Irrigation	PDI	Other
Annual Crops	73	57	3	5	41
Vegetables	47	29	0	9	5
Berries	32	4	1	20	18
Livestock	30	40	2	17	13
Beekeeping	50	0	0	20	15
Vineyard	40	0	0	60	60

The "Investment Development Program (PDI)" is used by 16% of farmers in the sample. This program co-finances investment projects that enable to modernize the production processes and provides support for project design and implementation. Overall, Linares and Cauquenes are the INDAP areas with greater use of instruments, followed by Talca and San Javier. In contrast, Parral is the area with less use of instrument (48%). Regarding to SIRSD program, its focus is clearly for annual crops and producers who work with pasture and animals; permanent crops being practically excluded from this benefit. Moreover, the use of PDI is oriented to permanent crops such as berries or beekeeping.

Characteristics of farmers: commercial profile (afc-1)

Table 4 (p. 150)shows the Cluster of Asset, Income and Costs; and the classification of "Management Indicators" related to records and initiation of activities (start-up). After cluster analysis, three homogeneous groups were identified for Assets, Income and Costs respectively.

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6 Currently this program is called System of Incentives for Agro-environmental Sustainability of Agricultural Soils.

In the case of Cluster Assets, homogeneous groups were generated preliminarily excluding those farmers who declared Assets by more than 3,500 UF (6.6% sample); thus, outliers farmers were avoided because could cause problems in the construction of the classification tree and subsequent separation of the groups into clusters. Once generated the three groups, those producers with more than 3,500 UF were located in Group I of the cluster Assets. Thus, the results of Cluster Assets indicate that 18.9% of farmers have an average of 2,616 UF in Assets and belong to Group I. Group II has an average of 1,349 UF in Assets and represents 17.5% of the sample, while 63.6% of the sample has 295 UF on average and belongs to Group III.

Regarding Income Cluster, 2.5% of producers have an average income of US$ 73,600 (Group I), while 21.2% average US$ 30,900 (Group II). Group III is the most numerous cluster (76.3%) and included farmers that declare income of US$7,400.

Table 4. Homogeneous Group by association variables.
Tabla 4. Grupos Homogéneos según variable de asociación propuesta.

Assets Cluster*	n	Mean (UF)
Group I	44 (+24)[a]	2,616 a**
Group II	63	1,349 b
Group III	228	295 c
Income Cluster*	**n**	**Mean (US$)**
Group I	9	73,600 a
Group II	76	30,900 b
Group III	274	7,400 c
Costs Cluster*	**n**	**Mean (US$)**
Group I	7	44,075 a
Group II	73	15,662 b
Group III	279	3,386 c
Management Grouping	**n**	**Management Indicator**
Group I	40	3
Group II	80	2
Group III	161	1
Group IV	78	0

a. This group includes farmers with more than UF 3500 in Assets declared.
* Cluster analysis was estimated using hierarchical clustering and then homogeneous groups were made using the K-means algorithm (SPSS v. 15).
** Different letters indicate significant differences according to one-way ANOVA and using Tukey post-hoc test (sig. 0.05).

a. En este grupo se incluyen los agricultores que superan 3.500 UF en activos declarados.
* Cluster realizado a través de conglomerados jerárquicos y posteriormente se confeccionaron los grupos homogéneos utilizando el algoritmo de K-medias (SPSS v. 15).
** Letras distintas indican diferencias significativas realizadas a través de ANOVA de una vía y utilizando la prueba post-hoc Tukey (sig. 0,05).

Regarding the Cost Cluster, Group I which represents 2% of the sample and have average production costs of US$ 44,075. Group II (20.3%) spent on average US$ 15,662 and Group III (77.7%) US$ 3,386. Additionally, there are 10 farmers who do not reported production costs during the season and were incorporated in Group III.

Moreover, the management indicator consisted of a single group of producers considering three indicators: start-up[7], keeps records of income and expenditure and if it leads productive revenue. Each of these items adds up to one point, that is, if the farmer has three points he complies with all requirements. The point of greatest compliance is "start-up" carried out by 73% of farmers.

Bases to support the proposed commercial profile AFC-1 are related to the use of inputs and products generated with these inputs. According Coelli *et al.* (3) and Bravo-Ureta *et al.* (2) the total production growth has three important effects: growth in the use of inputs, technical change and increasing in technical efficiency. Such indicators could be useful in finding a commercial profile for small-scale agriculture; however, are not easily observable indicators for INDAP, who manages and analyzes information. For this reason it is proposed as AFC-1 commercial profile producers who are in Group I or II of Farm Income; in Group I or II of production costs and also comply with initiation of activities. With these requirements, there is a 16.4% (n = 59) of farmers who have a commercial profile (AFC-1).

Additionally, we performed a multivariate cluster the amount of assets, revenues and costs simultaneously. The hierarchical cluster analysis displayed the presence of 2 groups. Group 1 includes 54 farmers (15.2%) and represents those farmers with commercial profile AFC-1. The details of the multivariate cluster analysis are shown in Table 5. Both analyze (Table 4 and 5) are consistent with the percentage of farmers with commercial profile AFC-1.

Table 5. Multivariate cluster of commercial profile AFC-1.
Tabla 5. Cluster multivariado para el perfil comercial AFC-1.

Multivariate Cluster	n	Mean Assets (UF)	Mean Income (US$)	Mean Costs ($)
Group AFC-1	54	1.328 (n.s.)	42775 *	17886 *
Rest AFC	305	1.151	8729	4702

Variables marked with an asterisk (*) indicate significant differences between the group of farmers with commercial profile AFC-1 and the rest of the sample. n.s.: not significant.

Las variables marcadas con asterisco (*) indican la existencia de diferencias significativas entre el grupo de agricultores con perfil comercial AFC-1 y el resto de la muestra. n.s.: no significativo.

Table 6 shows a comparison of some socio-economic and productive variables of farmers with commercial Profile AFC-1 and the rest of the producers. The comparison of means reveal significant differences in variables such as land size, access to credit and initiation of activities (start-up). Overall, 89% are male and the average age is 51 years with rates ranging between 25 and 79 years old. 62% of farmers belong to the Province of Linares, while Licantén, Curepto and Cauquenes are not farmers with commercial profile. 36% of farmers belong to the Parral area, 18% to Talca area, 13% to Linares area and 11% to San Clemente.

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7   The declaration of commencement of activities (start-up) is a formalized affidavit to the IRS (Servicio de Impuestos Internos or SII) about the beginning of any business or work likely to produce taxable income in the first or second category of the Income Tax Law (22).

Regarding to productive orientation, 46% of AFC-1 farmers have berries (raspberries and blueberries) as their main crop; 22% of farmers have vegetables and 20% of them produce annual crops. In a small proportion exists producers oriented to animal production (7.3%), beekeeping (3.6%) and vineyards (1.8%).

76% of producers with commercial profile receiving benefits from INDAP either a credit or instrument (PDI, SIRSD, irrigation or other). Specifically 57% of farmers have received credit, 27% received SIRSD and 20% received PDI. Thus, these results reveal the high dependence of commercial profile farmers AFC-1 with INDAP instruments.

Table 6. Socioeconomics and productive variables of commercial profile farmers (AFC-1).

Tabla 6. Variables socioeconómicas y productivas de agricultores con perfil comercial (AFC-1).

Variables	Unit	Mean		
		Commercial Profile	Rest of the AFC	Total Sample
Age (n.s.)	Years	51	51	51
Education level				
No studies		1.7%	3.6%	3.8%
Elementary Incomplete (*)		30.5%	42.3%	39.8%
Elementary Complete (*)	percentage	42.3%	24.7%	27.2%
High school Incomplete		8.5%	8.3%	8.4%
High school Complete		11.7%	18.3%	17.2%
Higher		5.1%	2.7%	3.5%
Gender (*)				
Male	percentage	89%	79%	80.4%
Female		11%	21%	19.6%
Family size (n.s.)	members	3.6	3.5	3.7
Property income (*)	US$	37,040	9,312	13,970
Cultivated area (*)	Ha	11.4	8.1	10.1
Start-up (*)	percentage	100%	46%	73%
Assets (n.s)	UF	1,535	1,059	1,118
Credit Access (*)	percentage	57%	37%	41%
Incentives (n.s.)				
SIRSD		27%	20%	21%
PDI	percentage	20%	15%	16%
Irrigation		1.6%	1%	1%
Others		30.5%	14%	17%
Number of cases		59	300	359

Variables marked with an asterisk (*) indicate significant differences between the group of farmers with commercial profile AFC-1 and the rest of the sample. n.s.: not significant.

Las variables marcadas con asterisco (*) indican la existencia de diferencias significativas entre el grupo de agricultores con perfil comercial AFC-1 y el resto de la muestra. n.s.: no significativo.

Finally, from the analysis is possible to estimate that 61% of farmers with commercial profile AFC-1 are members of the Group I and II of the Active Cluster; therefore, there are a significant percentage of farmers who have low physical capital available, but high input use and farm income and clearly has a commercial profile AFC-1.

CONCLUSIONS

This study explores new classification criteria of the AFC in Chile, defining a commercial profile or AFC-1 with emphasis on small-scale farmers in Maule Region, Chile. The commercial profile was determined using four criterions: Total Assets, Farm Income, Production Costs and Management Indicators.

The main findings show that 16.4% of farmers have commercial profile (AFC-1) and may no longer meet the requirements of the Act to be INDAP users. The farmers belong to AFC-1 show a high use of inputs; have increased the cultivated area, high commercial orientation and also high dependence of credit and other instrument provided by INDAP. AFC-1 requires the continued support of INDAP to avoid restrictions that might bound their competitiveness. Access to credit, investment and technical assistance are key factors in adopting new technologies. Restricting AFC-1 is then to hinder the farm income and thus restricting their permanency in the agricultural business.

The effort of INDAP to develop small-scale agriculture is strongly limited by the legal profile of the beneficiary of INDAP. These restrictions affect to AFC-1 farmers that have achieved positive results due to the use of different INDAP instruments; however, they not have yet the sufficient autonomy to continue without INDAP support. The study of new classification approach of the AFC in Chile and the definition of a commercial profile can help promote new policies that reoriented the development of new instruments of support for AFC in Chile.

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