JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

GOVERNMENT CENTRE FOR STRATEGIC STUDIES
OFFICE OF THE KONIN GOVERNOR
REPUBLIC OF POLAND

FINAL REPORT
FOR
THE STUDY
ON
REGIONAL DEVELOPMENT OF KONIN PROVINCE IN THE REPUBLIC OF POLAND

SECTOR REPORT

JULY, 1998

UNICO INTERNATIONAL CORPORATION
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LIST OF ABBREVIATION

	(Polish Acronims)	
APA	(AWRSP)	Agriculture Property Agency
ARiMR		Agency for Restructuring and Modernization of Agriculture
ARP		Industrial Development Agency
ARR		Agricultural Market Agency
BGK		Bank of National Economy
BPRSD		Road Network Development Planning
BSPO	(WBPP)	Bureau of Spatial Planning Office
BZK	(BGZ)	Bank of Food Economy
CPO	(CUP)	Central Planning Office
EU	(UE)	European Union
IBnGR		Gdansk Institute for Market Economics
GDDP		General Directorate of Public Roads
GUS		Central Office of Statistics
KERM		Economic Committee of the Council of Ministers
KIG		Konin Chamber of Commerce and Industry
KWB		Brown Coal Mine
NARDA		National Association of Regional Development Agencies
NBP		National bank of Poland
MAFE	(MRiGZ)	Ministry of Agriculture and Food Economy
NIF	(NFI)	National Investment Fund
NOT		Federation of Scientific Technical Associations
MOE	(MG)	Ministry of Economy
MOSZNIL		Ministry of Environmental Protection, National Resources and Forestry
MTME	(MTiGM)	Ministry of Transport and Maritime Economy
ODR		Agriculture Extension Service Centers
OSM		Dairy Cooperative
PAIZ		Polish Agency for Foreign Investment
PKP		Polish State Railway Company
PKS		Polish State Transportation Company
RCSS		Government Center for Strategic Studies
RDA	(ARR)	Regional Development Agency
SME Fund	(PFPiRMSP)	Polish Foundation for Promotion and development of SMEs
SSC	(SP)	State Treasury
ZUS		Social Insurance Company
ZE PAK		Power Station Patnow-Adamow-Konin
GDP	(PKB)	Gross Domestic Product
PLN		Polish New Zloty(s)
PCM		Project Cycle Management
PDM		Project design Matrix
SMEs	(MSP)	Small and Medium-scale Enterprises
SOA		Sales on Assets Ratio
VA		Value Added
WIBOR		Warsaw Interbank Offered Rates
ZOPP		Objective Oriented Project Formulation

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

List of Tables

List of Tables

List of Tables

List of Tables

List of Tables

List of Tables

List of Tables

List of Tables

List of Tables

List of Figures

List of Figures

List of Figures

List of Figures

List of Figures

List of Figures

List of Figures

Chapter 1

AGRICULTURE

Chapter 1 AGRICULTURE

1.1 Agriculture Development Policy

In this section, the main agriculture development policies are explained in relation to the state financing mechanism for the agriculture sector. Following the explanation of national development policies focused on accession to the EU, the assistance policy of the EU is also described.

1.1.1 National Agriculture and Rural Development Policy

Since accession to the EU is the most crucial objective of Poland, the Polish agriculture policy has basically taken the EU's agriculture policy into consideration. There are three main objectives: 1) modernization and efficiency improvement in agriculture; 2) market stabilization; and 3) privatization of the former state-owned farms. These policies are implemented by three agencies described in section (3) below.

(1) National budget

In 1995 (estimated base) and 1996 (estimated base) government expenditures for the agriculture, food and rural sectors are 8,660 million PLN. (9.47 percent of total budget) and 10,799 million PLN. (9.67 percent), respectively. Breakdown of the expenditure clearly shows that more than 70 percent of the expenditure (6,355 million PLN in 1995 and 7,880 million PLN in 1996) is planned to be allocated to private farmers' pension funds as Table 1.1-1 indicates. In other words, implementation of various agricultural policies is constrained by the limited budget. For example, regarding market intervention, only four percent was spent on price and income support in 1994 and was expected to be around three to four percent in 1995 and 1996.

Table 1.1-1 BUDGET SUPPORT FOR THE AGRICULTURE, FOOD AND RURAL SECTOR

Expenditure on:	1995 (projected)	(%)	1996 (plan)	(%)
I. Transfers and Subsidies	2,305,500	26.6	2,918,960	27.0
A Support for Current Operations	2,007,690	23.2	2,556,040	23.7
1 Interest subsidies for agricultural credits	240,000	2.8	387,000	3.6
2 Interest subsidies for lime fertilizer credits	0	0.0	0	0.0
3 Subsidies for lime production and transport	134,970	1.6	175,000	1.6
4 State institutions (research, education, culture)	338,000	3.9	418,190	3.9
5 Biological progress, extension, etc.	213,510	2.5	277,520	2.6
6 Transfer to MAFE for co-financing purposes		0.0		0.0
FRiOR	0	0.0	0	0.0
ARiMR	404,000	4.7	382,500	3.5
Water treatment system	0	0.0	0	0.0
7 Agency for Agriculture Market (ARR)	240,000	2.8	288,000	2.7
8 Transfer through voivodoships	398,960	4.6	478,200	4.4
9 Fuel subsidies	0	0.0	0	0.0
10 Contingencies and other supports	38,250	0.4	149,630	1.4
B Support for Investments	297,810	3.4	362,920	3.4
1 Ministry of Agriculture and Food Economy (MAFE)	29,120	0.3	42,350	0.4
2 Infrastructure investment	196,050	2.3	242,100	2.2
3 Rural development Fund (WB-ASAL)	70,000	0.8	77,000	0.7
4 Other support (including ARR)	2,640	0.0	1,470	0.0
II. Private Farmers Pension Fund	6,354,860	73.4	7,880,190	73.0
III. Total Support(I+II)	8,660,360	100.0	10,799,150	100.0
IV. Total State Expenditures	91,467,300		111,676,810	
Share of I to IV	2.52%		2.61%	
Share of II to IV	6.95%		7.06%	
Share of III to IV	9.47%		9.67%	
V. Total State Expenditures Net of Debt Services	75,867,380		93,694,470	
Share of I to V	3.04%		3.12%	
Share of II to V	8.38%		8.41%	
Share of III to V	11.42%		11.53%	

Source: Ministry of Finance

(2) Agriculture taxation system

The agricultural tax is collected solely from agricultural land including forests and land under ponds and buildings with an area of more than 1 ha. Land area less than 1 ha is not subject to the agricultural tax but to the real estate tax. In principle, revenues of farmers from agricultural production are not subject to income tax except for special sectors[1]. The Ministry of

[1] growing in glasshouses and heated plastic-covered greenhouses, mushroom production, growing of plants "in vitro", farm breeding and rearing of fattened and egg-laying poultry, poultry hatching, breeding and rearing of furred and laboratory animals, earthworm breeding, entomofag breeding, silkworm breeding, running of bee yards, breeding and rearing of other animals beyond a farm

Agriculture and Food Economy determines the minimum "sizes" of business within the special sectors subject to income tax. In addition, there are local taxes and payments as social security for farmers providing for accidents, sickness, maternity, disability pension, and social security pension.

(3) Implementation of agricultural policies

Based upon the above, the following agencies and organizations are implementing various development policies. Table 1.1-2 shows such agencies and organizations according to different tasks. In this section, how the above-mentioned three main development policies are implemented is explained in turn.

Table 1.1-2 IMPLEMENTING AGENCIES AND ORGANIZATIONS OF AGRICULTURE POLICIES

Purposes	Implementing Agencies/Organizations
1. The Ministry of Agriculture and Food Economy	
1) Production techno bgy, inspection, and other agriculture services	Office of Ministry of Agriculture and Food Economy
	Centre for Education and Extension in Agriculture
	State Inspection for Plant Protection
	Seed Inspection Services
	Central Research Institute for Crops Varieties
	Agricultural schools
	Centre for Improving Qualifications of Agricultural Teachers
	Chemical and Agricultural Stations
	Central Animal Breeding Offices
2) Market stabilization (intervention)	**Agricultural Market Agency**
3) Modernization and efficiency improvement in agriculture	**Agency for Restructuring and Modernization of Agriculture (ARMR)**
Development of rural infrastructure Subsidies to credit managed by ARMR	
4) Privatization of State-Owned Farms	**Agricultural Property Agency of State Treasury**
2. Provincial Offices	Agricultural Extension Centres
	Council of Reclamation and Water Arrangement
	State Veterinary Inspection (State Veterinary Services)
	Genetic and Rural Areas Office
	Reclamation Equipment Conservation Offices

Source: Made by JICA Study Team based on data from the Ministry of Agriculture and Food Economy

1) Modernization and efficiency improvement in agriculture

The Agency for Restructuring and Modernization of Agriculture (ARiMR) is responsible for improving rural community living standards by improving the quality and efficiency of production. Planned budget from

the state is 404 million PLN. (4.7 percent of total state budget) and 382.5 million PLN. (3.5 percent) in 1995 and 1996, respectively. In 1996, its funds consisted of state budget (58 percent:382.5 million PLN.) of total funding, interest on obligatory bank reserves (12.06 percent:79.5 million PLN.), and other sources including World Bank's ASAL-300 loan. ARiMR provides assistance through 32 associated banks in the form of: a) interest subsidies on investment and working capital loans; b) guarantees for payment of bank credits and loans; c) co-financing of undertakings related to technical and production infrastructure for rural activities; and d) subsidies for activities related to practical vocational training, advisory and information services in agriculture and the agricultural environment. Presently, the ASAL loan is terminating and ARiMR is looking for new financial sources.

Presently, agricultural credit lines provided through ARiMR's 32 associate banks are the most popular agricultural credits because of interest rates as low as one-fourth or one-fifth of commercial rates. Among 28 credit lines, the sector and regional lines (such as livestock sector) and land purchase line are used more in Konin Province compared with the national average as shown in Table 1.1-3 below.

Table 1.1-3 OBJECTIVES OF CREDIT LINES FROM 1994 TO 1996

	Basic Investment	Sector and Regional	Land Purchase	Young Farmer	Restoring Production	Production Start	Creating New Nonagricultural Job Opportunities	Natural Calamity
Konin	37.4%	22.5%	11.4%	27.7%	0.0%	0.1%	0.8%	0.0%
Poland	47.5%	14.5%	7.4%	28.5%	0.0%	0.2%	1.8%	0.2%

Source: The Agency for Restructuring and Modernization of Agriculture, Warsaw

In 1998, the number of credit lines further decreased to eight. They are:

a) credits for agriculture services (15.19-15.31 percent, maximum 8 years with grace period of 2 years)

b) credit for agriculture land purchase (6.13 percent, maximum 15 years with grace periods of 2 years)

c) credit for young farmers under 40 (6.13 percent, maximum 15 years with grace periods of 2 years)
d) credit for restructuring and modernization of milk industry (7.66 percent, maximum 8 years with grace periods of 2 years)
e) credit for programs for common machinery use (7.66 percent, maximum 8 years with grace periods of 2 years)
f) credit for new job opportunities in rural areas (6.13 percent, maximum 8 years with grace periods of 2 years)
g) credit for areas which suffered from natural disasters

2) Market stabilization

The Agricultural Market Agency (ARR) is responsible for stabilizing the agricultural market and ensuring agricultural producers income. Estimated and planned budget for ARR accounted for 2.8 percent (240 million PLN.) and 2.7 percent (288 million PLN.) of the total state budget in 1995 and 1996, respectively.

ARR is implementing a broad range of market intervention under the supervision of the Ministry of Agriculture and Food Economy (MAFE). The activities of ARR include purchase and sale of agricultural products, accumulating and managing state reserves of agricultural products, granting credit guarantees and support for the development of wholesale markets. The following are intervention policies: a) minimum prices are fixed for wheat and rye for human consumption; b) procurement prices and sugar beet quantities are fixed according to domestic use and exports; c) minimum intervention prices are fixed for milk, demand butter and skimmed-milk powder purchased from a dairy; d) occasional purchase of pork and beef takes place for maintaining state reserves; and e) intervention measures are limited to export and import for other produce except for a serious market imbalance.

Due to price gaps between the EC countries and Poland, market support prices in Poland are lower than EC prices except for wheat and pork. According to "the Agenda for the year 2000", cereal prices in Poland are stabilized closer to the world price than the EC and the intervention prices

of wheat and pork were 79 percent of the EC intervention price in 1995-96. Pork prices were on average 83 percent of those of the EC between 1993 and 1995. However, the target price for stabilized cow's milk was 50 percent of the EU price in 1995/96, and beef prices were still 46 percent of the EC price in 1995.

3) Privatization of the former state-owned farms

The Agricultural Property Agency (APA) of the State Treasury is responsible for privatization of state property in Polish agriculture. Unlike other Central and East European countries, the share of former state farms and cooperatives was twenty per cent of total arable land. Around ten per cent of the land of the former state farms has been privatized and the rest of the land has been leased. The property taken over by APA is either sold or leased upon tendering (auctions or bidding of written offers).

Purchasers of land plus buildings owned by APA are allowed to buy the assets at preferential interest rates of 4 to 5 percent per annum, which is about one-fourth of commercial interest rates. People can buy land up to 300 ha including buildings and other assets after winning in a public auction.

(4) Pre-accession strategy towards the EU

Accession to the EU is the most important task for Poland, and the agriculture sector is no exception during the negotiation period. Regarding pre-accession funds, the Ministry of Agriculture and Food Economy prepared a proposal for the pre-accession program with a total amount of 1,050 million ECU for the years 1998 - 2000. There are three priority directions in the program. Goals of these priorities are stated below.

Priority 1 Modernization of Polish agri-food sector (applied amount : 300 million ECU)

- support market orientation of farms, downstream industries and food processing activities
- strengthening agriculture market infrastructure
- better vertical integration of agri-food chain
- distinct progress in the quality of production

- cost reduction
- increase satisfaction of consumers
- raise income from farming

Priority 2 Integrated development of rural areas (400 million ECU)

- support technical infrastructure (roads, water intakes, water supply pipelines, gas supply systems, irrigation systems, sewage disposal networks, sewage treatment plants, waste management, power supply systems and telephone lines)
- generation of new jobs and alternative sources of incomes in rural areas
- support small and micro enterprises
- diversification of economic activities
- comprehensive special planning
- local tourism

Priority 3 Establishment of systems and administrative structure necessary for an effective implementation of EU legislation (350 million ECU)

- implementation of administrative reforms
- human resource development
- rearrange and adjust agriculture structures

1.1.2 EU's Assistance Policy on Polish Agriculture Development

(1) EU's assistance policy towards Polish agriculture

Instead of providing direct income support to producers, the EU considers it necessary for candidate countries including Poland to receive aid for developing their agriculture and processing structures in order to gradually prepare them for full integration into the common agriculture market. Based upon the concept, the EU has shifted its assistance policy from sectorial assistance to more integrated rural development and rural environment conservation. In other words, agriculture policy has gradually changed to modernization of agriculture and multifunctional rural development. Targets of the rural development policy are not just about agriculture and farmers, but also stimulation of institutional development in the poorest regions.

The Foundation of Assistance Program for Agriculture (FAPA) administers and coordinates credit facilities provided under the EU-PHARE program and other foreign assistance programs for Polish agriculture on behalf of the Ministry of Agriculture and Food Economy. Regarding the PHARE program, a main assistance area is technical assistance rather than direct financial support to private farmers. From 1991 to 1995 over 160 projects were approved for assistance.

1.1.3 Foreign Financial Assistance for Polish Agriculture Development

Apart from the state budget, foreign financial assistance has been utilized for Polish agriculture development. The EU intends to increase its assistance to Poland, while other existing sources including the World Bank and USAID are decreasing assistance amounts. Therefore, the assistance associated with the EU is explained in this section.

(1) Pre-accession fund

The Polish government is now applying to the EU for pre-accession aid for agriculture amounting to ECU 1,050 million as stated above. The aid will be utilized for priority areas such as improvement of conversion structure, marketing channels and food quality control, as well as specific integrated development projects designed to provide support for local initiatives, the supply of basic services and the improvement of local infrastructures. It is expected that a total ECU 500 million per year, at maximum, will be granted to candidate countries from the year 2000. The allocation of the fund is to be determined.

(2) PHARE Program

Two main assistance areas in the agriculture sector are institutional building and the financing of investment projects. The allocation is planned to be 30 percent and 70 percent, respectively. It also plans a) to concentrate on projects which apply the European Commission's rules and standards, as well as measures implementing common policies; b) to improve budgetary implementation; c) to increase the size of projects rapidly; and d) to decentralize management in favor of the recipient countries.

1.2 Agriculture in Konin Province

The agriculture sector plays an important role in Konin Province in terms of land utilization and employment. Agriculture land accounts for 71 percent (365,101 ha) of total land (513,672 ha), and 43 percent (85,700) of total employed (200,000) in 1996. In this section, the present agriculture situations are summarized in the following manner. First, characteristics of Konin's agriculture are described in comparison with other provinces and national averages, followed by present major development policies. Then, basic production conditions including natural and infrastructural are explained. Based upon these basic information, the present production situations are described. Finally, agriculture support systems are briefly explained with relevant social information.

1.2.1 Status of Konin Province in Polish Agriculture Production

(1) General characteristics

The productivity of Polish agricultural land in general is estimated to be about sixty per cent of leading European countries. However, its agricultural potential differs from province to province, and some of them reach eighty per cent of EU productivity level. The most developed agriculture areas are located in the central part of Poland; namely, Poznan, Kalisz, Opole and Leszno. Although located next to these provinces, Konin Province does not have good agricultural conditions, and the"Quality Index for Agriculture Production", prepared by the Research Institute of Soil Cultivation, Fertilizing and Pedology ranks Konin at 42nd out of 49 provinces as shown in Table 1.2-1. The following characteristics are observed.

a) water conditions are lower than the national average
b) climatic conditions are slightly higher than the national average
c) the level of fertilization is lower than the neighboring agriculture provinces
d) production yields of crops represented by potatoes and cereals are lower than the national average.

Table 1.2-1 COMPARISON OF KONIN PROVINCE WITH NEIGHBORING PROVINCES IN TERMS OF QUALITY FOR AGRICULTURE PRODUCTION

	Konin	Poznan	Kalisz	Sieradz	Lodz	Plock	Wloclawek	Bydgoscz	Poland
1 Quality Index for Agricultural Production (Rank)	42	20	29	37	43	15	23	17	
(Index)	59.4	67.6	63.6	61	59.4	71.4	66.7	69.5	
Quality and agricultural Usability	41.4	49.7	43.6	41.8	41.4	53.4	49.7	53.1	49.5
Agriclimate	10.8	10.5	12.6	12.2	10.9	9.9	9.5	9.3	9.9
Water conditions	2.5	2.8	3.0	2.5	2.8	3.5	3.2	3.2	3.3
2 Production Yield 1996: Cereals (ton/ha)	267	360	326	248	250	266	291	320	290
3 Production Yield 1996: Potatoes (ton/ha)	191	237	191	190	194	206	199	227	203
4 Fertilizer Utilization 1996: NPK (kg/ha)	93.9	123	101.3	96	71	35.2	121.9	129.2	83.6
5 Natural Fertilizer Usage 1996 (10ton/farm)	38	39	46	42	36	39	40	34	35
6 Annual Rainfall (1995 IV - 1996 III)	561	556	547	591	500	48.9	n.a.	525	579
7 Period of Vegetation (1996)	234	241	232	231	232	233	233	233	232

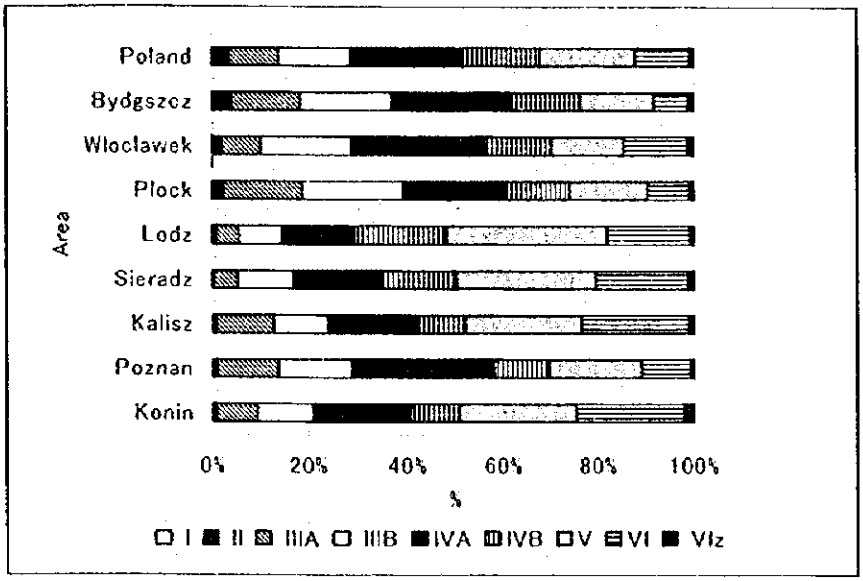
Source: 1: Research Institute of SoilCultivation, Fertilizing and Pedology, 2-7: GUS

Note : Total number of provinces is 49

(2) Soil condition

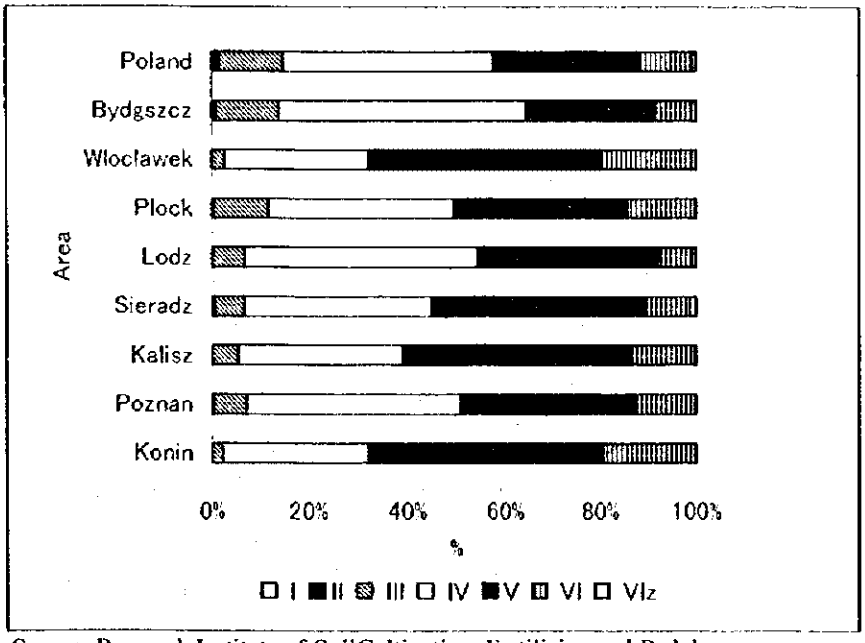
Figures 1.2-1 and 1.2-2 show that soil conditions of arable land and grassland in Konin Province are less fertile compared not only with neighboring provinces but also with the national average. Looking at arable land quality, the share of soil which is appropriate for cultivation (class I to IV) is 50.6 percent in Konin Province, whereas the national average is 67.7 percent. This is one of the serious constraints on agricultural development in Konin Province.

Figure 1.2-1 COMPARISON OF KONIN PROVINCE WITH NEIGHBORING PROVINCES IN TERMS OF SOIL QUALITY (ARABLE LAND)



Source: Research Institute of SoilCultivation, Fertilizing and Pedology

Figure 1.2-2 COMPARISON OF KONIN PROVINCE WITH NEIGHBORING PROVINCES IN TERMS OF SOIL QUALITY (GRASSLANDS)



Source: Research Institute of SoilCultivation, Fertilizing and Pedology

(3) Share of production

Table 1.2-2 shows production shares of Konin's major agricultural produce within the whole country in 1996. The highest share is observed in rye, which was 3.6 percent of national production.

Table 1.2-2 THE SHARE OF AGRICULTURE PRODUCTION OF KONIN IN POLAND IN 1996

(Unit: 1,000 tons)

	Wheat	Rye	Barley	Potatoes	Sugarbeet	Cabbage	Carrots	Cucumber	Tomatoes	Apples
Poland	8,576	5,653	3,437	27,217	17,846	1,832	794	503	231	1,952
Konin	133	203	45	640	470	21	11	5	2	22
(%)	1.6%	3.6%	1.3%	2.4%	2.6%	1.1%	1.4%	1.0%	1.1%	1.1%

Source: Konin Statistical Office

(4) Productivity compared with national average

Average production yields of major crops in Konin are generally lower than the national average as Table 1.2-3 shows.

Table 1.2-3 YIELD OF MAJOR CROPS IN 1996

(Unit: ton/ha)

	Wheat	Rye	Barley	Sugarbeet	Potatoes	Cabbages	Onions	Tomatoes	Carrots	Apples
Konin	3.49	2.21	2.95	2.54	19.1	40.5	24.6	7.3	26.9	25.5
Poland	3.56	2.34	3.07	3.94	20.3	38.3	20.4	9.7	27.5	36.1

Note: In the case of apples, figures indicate production amount of apples per one tree(kg/tree)
Source: Data on Poland are obtained from GUS, data on Konin are obtained from Konin Statistical Office

(5) Agriculture development policy of Konin Province

The following are the present agricultural development policies of Konin Province. An infrastructure for agriculture includes water resource for irrigation, on-farm irrigation, on-farm drainage, farm roads, agricultured facilities, and rural public facilities. Among them, water resource development is considered to be one of the most important issues for Konin's agriculture.

1) Water resource development programs

In order to cope with water shortage problems, the office of the Konin Governor has a water resource development policy called "Small Retention Program." The existing Jeziorsko dam is available for irrigation, but the water availability of the dam is limited because the dam has several purposes besides irrigation and it's supplying water to not only Konin province but also some of neighboring provinces (see Table 1.2-8). The Small Retention Program, which has been designed by the provincial office, aims at constructing a number of reservoirs in the whole province in order to secure water resources for irrigation. An outline of the program is shown in Table 1.2-4. Table 1.2-5 shows the total capacity of existing and planned reservoirs of the "Small Retention Program". However, due to the need for restoration and reinforcement of the facilities damaged by the flood in the year 1997, these programs are not financed at present.

On the other hand, on farms irrigation facilities are principally installed by individual producers and the office has no concrete plans for on-farm management systems at this moment.

Table 1.2-4 OUTLINE OF SMALL RETENTION PROGRAM

Program		Unit	Quantity	Remarks
Construction of valley reservoirs	Number	nos	16	Existing 4 Planned 12
	Effective Capacity	$1000m^3$	18,820	Existing 15,163 Planned 3,657
Damming up of existing reservoirs	Number	nos	8	
Construction of weirs on canals	Number	nos	93	
Construction of small rural reservoirs	Number	nos	32	

Source: Konin provincial office for amelioration and water arrangement (WZMiUW)

Table 1.2-5 EXISTING AND PLANNED CAPACITY OF RESERVOIRS BY SMALL RETENTION PROGRAM

	Number (nos)	Capacity (m^3)
Existing Reservoirs	4	15,163,000
Planned Reservoirs	12	3,657,000
Total	16	18,820,000

Source: Konin provincial office for amelioration and water arrangement (WZMiUW)

2) Afforestation program by 2020

Regarding land use, an afforestation program for less fertile and unused land such as class V and VI is now under consideration. The program plans to afforest 31,754 ha of land in the whole of Konin Province. However, there is no budget for afforestation in the provincial office at this moment.

3) Enlargement of land size per farm

Agriculture land per farm is small and/or scattered in the province, which is one of the most serious constraints on agricultural development in Konin Province. Therefore, the office of the Konin Governor intends to integrate land in the long run. Presently, some land purchase transactions are observed but the number is limited.

4) Promotion of producers group

According to the "Act on Chamber of Agriculture (1995)", the Chamber of Agriculture (the Chamber) was established in Konin Province in 1996 with full financial support from the state budget. All agriculture producers can be a member of the Chamber's branches located in each Gmina, and out of them, one or two representatives are selected to be members of the Chamber as representatives of Gminas[1]. The Chamber of Agriculture is expected to be an impetus for group formation.

[1] Tasks of the Chamber written in the Act are as follows. 1) Development of legal regulations concerning agriculture; 2) Improvement of producers' education and qualification standards; 3) Implementation of producers' profitability by

1.2.2 Natural Conditions

The agricultural production and natural conditions in Konin Province is summarized below.

(1) Climate

The climate around Konin province is characterized by the following facts based on the data given in ANNEX I.

a) The annual precipitation is small (approximately 500mm on average, ranging from 300 to 700mm).
b) A large amount of precipitation in a short period often causes floods which sometimes damage agricultural production.
c) Continuous heavy rainfall sometimes causes difficulties in field operations and damages crop production.
d) Low temperature in early spring, shortage of hours of daylight and water shortage in vegetation season (April to October), especially in summer, sometimes damage agricultural production.

Compared to the climate of other areas, the amount of precipitation is smaller in Konin province. For example, the year 1994 is characterized by much rainfall in spring and little rainfall in summer, and the total precipitation of that year is close to the 30-year average value. The climate data of that year shows that the amount of rainfall in April through November in Konin province is 20% less than in most other regions of the country. More frequent water shortage in the province is a reason why Konin province has been selected as one of the priority districts of water resource development.

(2) Soil quality

As described in ANNEX I, the soil profiles around Konin Province mainly consist of podzolic and luvisolic soils (after FAO/UNESCO classification)

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restructuring farms and developing agricultural commodity exchanges; and 4) Cooperation with administration and self-government organizations (councils) and professional trade organizations in Poland and abroad.

originated from weathered glacial deposits. The soils are less fertile than the national average and in some of the neighboring provinces. However, the soil conditions, as well as topography and climate, are not necessarily bad for cereal production.

On the other hand, in recent several decades, cultivated crops have been diversified in accordance with social and economic changes, and artificial fertilizers have been markedly used on farm land since the mid-1960s. Under those situations, soil conditions have been changing.

1.2.3 Agricultural Infrastructure

Table 1.2-6 shows the present status of the principal infrastructure for agricultural development; that is, the infrastructure for amelioration in Konin Province.

Table 1.2-6 PRESENT STATUS OF AGRICULTURAL INFRASTRUCTURE IN KONIN PROVINCE

Description			Unit	Quantity
Proposed area for installation of amelioration facilities			ha	201,541
Existing facilities	Area which is already equipped with amelioration facilities	Total	ha	152,736
		On-farm irrigation	ha	7,875
		Main canals	ha	132,875
	On-farm facilities	Canals	km	3,756
		Pipelines	km	150
	Main facilities			
	Rivers	Total	km	1,215
		Regulated	km	766
		Embankment	km	237
	Pump stations for drainage	Number	nos	10
		Capacity	l/s	33,334
	Reservoirs	Number	nos	4
		Surface area	ha	2,103
		Effective capacity	$1000m^3$	15,163

Source: Konin provincial office for amelioration and water arrangement (WZMiUW)

(1) Irrigation facilities

While water conditions are low compared with other provinces, the ratio of irrigated areas to total cultivated areas is 0.8 percent in 1996 as shown in Table 1.2-7. Main canals are well developed; however, inadequate supply of water to farm lands affected production significantly during drought seasons in recent several years.

Table 1.2-7 IRRIGATED AREA IN THE PROVINCE IN 1996

Crop	Cultivation Area (ha)	Total Area (ha)	Irrigated Area (ha)
Cereals	205,151	263,018	1,980 (0.8%)
Field Crops	49,467		
Vegetables	3,988		
Fruits	4,412		

Source: Konin provincial office for amelioration and water arrangement (WZMiUW),Konin Statistical Office

Note: Farm survey shows a higher proportion of farms having irrigation facilities as presented below. This is because the sample farms are selected intentionally, and because farms with relatively small farmlands have installed irrigation facilities.

Type of farm	Land size	Total number of samples	Farms which have on-farm irrigation facilities	
			(nos)	(%)
Cereals or Livestock and cereals	less than 10ha	57	8	14.0
	more than 10ha	66	7	10.6
	Total	123	15	12.2

A multipurpose dam called Jeziorsko has been constructed at the upper stream of the Warta River, on the southeastern boundary of the province. The reserved water covers 57,000 ha of farmland located in the upper stream of the Warta River. Table 1.2-8 gives a description of the dam.

Table 1.2-8 DESCRIPTION OF JEZIORSKO DAM

Total capacity	203,000,000m^3
Effective capacity	172,000,000m^3
Major Objectives	1) Preserving irrigation water for 57,000ha farm land
	2) Protection against flooding (for Konin and Poznan province)
	3) Preserving water for industry (in Konin and Poznan province)
	4) Hydropower plant
	5) A recreational spot for neighboring industrial districts and cities
	As an indirect effect, it aims at:
	6) Activating the economy in neighboring areas

Source: Konin provincial office for amelioration and water arrangement (WZMiUW)

There are a number of small rivers and canals used mainly for drainage purposes. These water resources contribute to irrigation, but are mainly found in grasslands by natural infiltration of water into the subsoil. Thus, most plant-cultivated areas are not irrigated at present. Regarding on-farm irrigation facilities, many farms have installed facilities such as pumps, wells, and sprinkler systems by themselves. A very few farms have installed such on-farm facilities by themselves due to financial difficulty.

(2) Drainage and flood protection

Several projects have been conducted in order to construct pump stations and embankments. Also, the Jeziorsko dam and reservoirs for irrigation have contributed to flood protection. However, the embankments have often been damaged by frequent floods, and the damaged embankments had to be repaired or strengthened each time. On the other hand, on-farm drainage facilities are not well developed, but main canals have been arranged in the whole province.

(3) Farm roads

Main roads and communal roads are well developed. However, farm roads which connect villages and individual farmlands are not fully developed, due to the limited budget of the Gmina office. As a result, producers who live in places distant from main roads are sometimes prevented from having buyers come to farms or going to sale places. Therefore, some producers are constructing connecting farm roads by themselves.

(4) Institutions for water-use regulation

The following institutions are responsible for water usage regulation.

a) Department of Environmental Protection

- gives permission for water use

b) National Inspection of Environmental Protection

- tests water quality and collects water fees

c) Provincial Office for Amelioration and Water Arrangement

- plans water use, water regulation and amelioration facilities

There are problems of collecting water users' fees. The national fund, the provincial office, and Gmina offices are collecting water fees separately according to sources of water such as lakes, rivers, and wells. However, the number of staff for collecting water fees is not sufficient present.

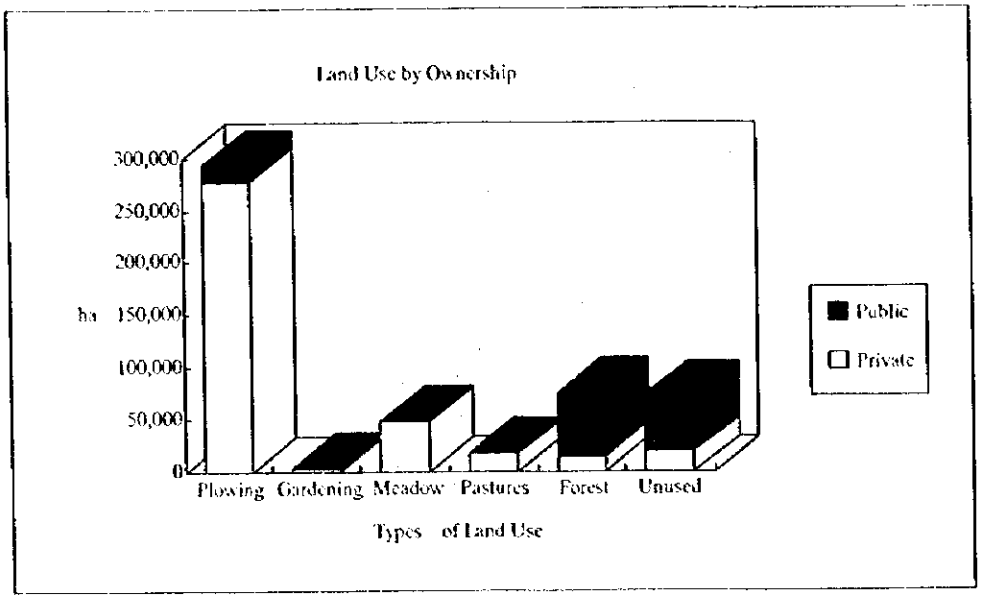
1.2.4 Agriculture Production

(1) Land use and cropping pattern

Presently, 365,101 ha of area is utilized for agricultural purposes, which is 71 percent of the total land (513,672 ha). Among agriculture land, arable land is 293,331 ha (57 percent of total land), orchards are 4,412 ha (0.9percent), meadows are 49,360 ha (9.6percent), pastures are 17,999 ha (3.5percent), forest is 75,762 ha (14.7 percent) and unused land is 72,809 ha (14.2 percent). The total area of state assets including former state farms and cooperative farms is 35,673 ha which is under the control of the Agricultural Property Agency of the State Treasury. 7,068 ha (about 20 percent) was sold up to now, and 18,126 ha (about 50 percent) is now under lease contract.

Between 1988 and 1996, the total area of arable land decreased by 3.5 percent from 28,100 ha to 27,690 ha, whereas that of fallow and non-used land increased rapidly from 600 ha in 1988 to 11,900 ha in 1996. As Figure 1.2-3 shows, in 1996, 91.9 percent of arable land (335,600 ha) is owned by private producers. On the contrary, 80 percent of forest and 74 percent of unused land are owned by the state sector.

Figure 1.2-3 LAND USE BY TYPES OF OWNERSHIP



Source: Konin Statistical Office

Table 1.2-9 shows the cultivation areas of main crops. Poor soil and climatic conditions has limited crop diversification in Konin Province, and the major crops cultivated in the province are as follows. Cultivated areas of rye are larger than those of the national average.

- food crops: wheat, rye, potato
- fruit trees: apple
- vegetables: cabbage, onion, cucumber, tomato
- field crops: sugar beet
- oil crops: rape seed
- fodder crops: wheat, rye, barley, alfalfa, pasture

Table 1.2-9 CULTIVATION AREA OF EACH CROP IN KONIN AND POLAND IN THE YEAR 1996

	Konin		Poland
	Cultivation Area (ha)	Ratio (%)	Ratio (%)
Cereals	205,151	78.0	75.7
Wheat	38,944	14.8	21.7
Rye	91,496	34.8	21.1
Barley	14,954	5.7	9.9
Oat	11,681	4.4	5.5
Wheat-rye	19,395	7.4	6.1
Field Crops	49,467	18.8	20.1
Maize	2,453	0.9	2.0
Potato	33,501	12.7	11.7
Sugar beet	11,941	4.5	4.0
Rape	1,572	0.6	2.5
Vegetables	3,988	1.5	2.1
Cabbage	519	0.2	0.4
Cauliflower	107	0.0	0.1
Onion	1,023	0.4	0.1
Carrot	414	0.2	0.3
Cucumber	533	0.2	0.2
Tomato	340	0.1	0.2
Fruits	4,412	1.7	2.0
Strawberry	345	0.1	0.5
Total	263,018	100.0	100.0

Source: GUS, Konin Statistical Office

(2) Trend of agriculture production

The share of plant and livestock production in Konin Province is about forty to sixty. Tables 1.2-10 and 1.2-11 show the production trend of major produce in Konin Province from 1990 to 1996.

Basically, plant production is recovering from a serious decline in production in 1992. Among cereals, rye shows the biggest production size followed by wheat and cereal mix. Potato production fluctuates year by year, reaching more than one million ton in 1993 but dropping to 0.64 million in 1996. Production volume for sugar beets is determined by the government and changed yearly according to production quotas. Regarding vegetables and fruit, production of cabbages, onions and apples

is increasing, whereas tomatoes and cucumber show declining trend. The main reason is lower farmgate prices of these produce under over-supply conditions.

Table 1.2-10 TREND OF MAJOR CROP PRODUCTION IN KONIN PROVINCE FROM 1990 TO 1996

(Unit: ton)

	1986-90	1991	1992	1993	1994	1995	1996
Wheat	108,804	127,343	86,715	110,554	100,000	125,308	133,094
Rye	212,622	231,749	126,011	179,037	179,457	222,973	202,932
Barely	40,658	41,412	25,867	29,967	31,412	37,144	44,697
Oats	33,013	32,606	16,576	22,670	21,233	28,401	28,504
Wheatrye	20,049	44,737	31,599	40,686	44,270	47,244	61,028
Cereal Mix	93,267	100,128	51,970	73,035	58,188	93,879	76,850
Potatoes	850,803	746,530	412,074	1,008,817	548,632	627,634	640,497
Sugarbeet	440,908	385,374	320,199	536,431	302,864	377,305	470,266
Oilseeds	19,783	12,221	9,265	8,951	12,511	20,108	2,375
Leguminous crops	2,497	2,778	1,861	1,475	496	1,794	884
Cabbage	15,457	15,717	10,097	33,664	18,995	24,112	21,005
Cauliflower	2,743	2,296	1,377	3,128	1,925	2,163	1,858
Onion	12,935	16,627	12,667	30,240	20,059	41,398	25,189
Carrots	8,398	10,488	7,942	17,575	10,355	11,833	11,104
Beet	6,473	8,076	5,723	14,584	8,571	10,282	8,816
Cucumber	4,182	5,720	5,564	5,962	5,101	8,220	5,033
Tomatoes	6,715	6,572	7,014	4,775	4,299	5,496	2,472
Apples	10,334	20,598	13,014	22,149	11,535	19,978	22,182
Pears	742	1,801	1,663	3,021	1,258	1,825	844
Plums	547	1,752	1,544	2,419	1,312	1,999	2,560
Sweet Cherries	1,141	2,723	2,254	3,141	2,391	4,026	4,116
Sower Cherries	142	374	411	1,175	732	1,144	1,125
Others(peach, apricot, nuts)	38	158	148	1,149	623	596	631
Strawberry	1,489	2,066	1,128	961	601	961	616
Rasberry	1,489	2,066	1,128	961	601	961	616
Current	1,221	1,801	1,751	1,894	1,573	1,978	2,762
Gooseberry	333	405	478	474	416	701	675
Bilberry	0	18	62	121	76	622	578

Source: Konin Statistical Office

2) Livestock production

There has been an increasing trend toward pig production from 1988 to 1996 due to shorter breeding periods (six months), and easier breeding methods compared with other livestock. On the other hand, production of cattle, sheep and horses shows a declining trend due to relatively lower farmgate prices, compared with pigs, and a longer breeding period. As a result of the decreased number of cows, milk production has decreased in recent years. Therefore, farmgate prices of cows and milk increased faster than CPI increasing rates as shown in Figure 1.2-4 (4) of the next section. Chickens and eggs are produced mainly by small farms on a small scale.

Table 1.2-11 TREND OF LIVESTOCK PRODUCTION IN KONIN FROM 1990 TO 1996

(Unit: ton)

	1990	1991	1992	1993	1994	1995	1996
Pigs	39,030	44,591	48,052	48,804	43,316	56,200	63,200
Cattles and Cows	31,473	25,422	22,931	13,493	14,606	19,330	22,300
Chickens	4,929	5,361	5,418	5,221	5,156	5,183	5,800
Eggs(pieces)	120,299	106,665	108,355	108,125	107,692	99,359	120,143
Milk(kl)	312,579	309,664	278,023	276,689	282,858	252,620	253,329
Butter(kg)	6,510	5,277	5,384	5,123	4,504	4,221	2,530
Cheese(kg)	3,267	3,381	3,638	4,085	4,849	5,112	5,732

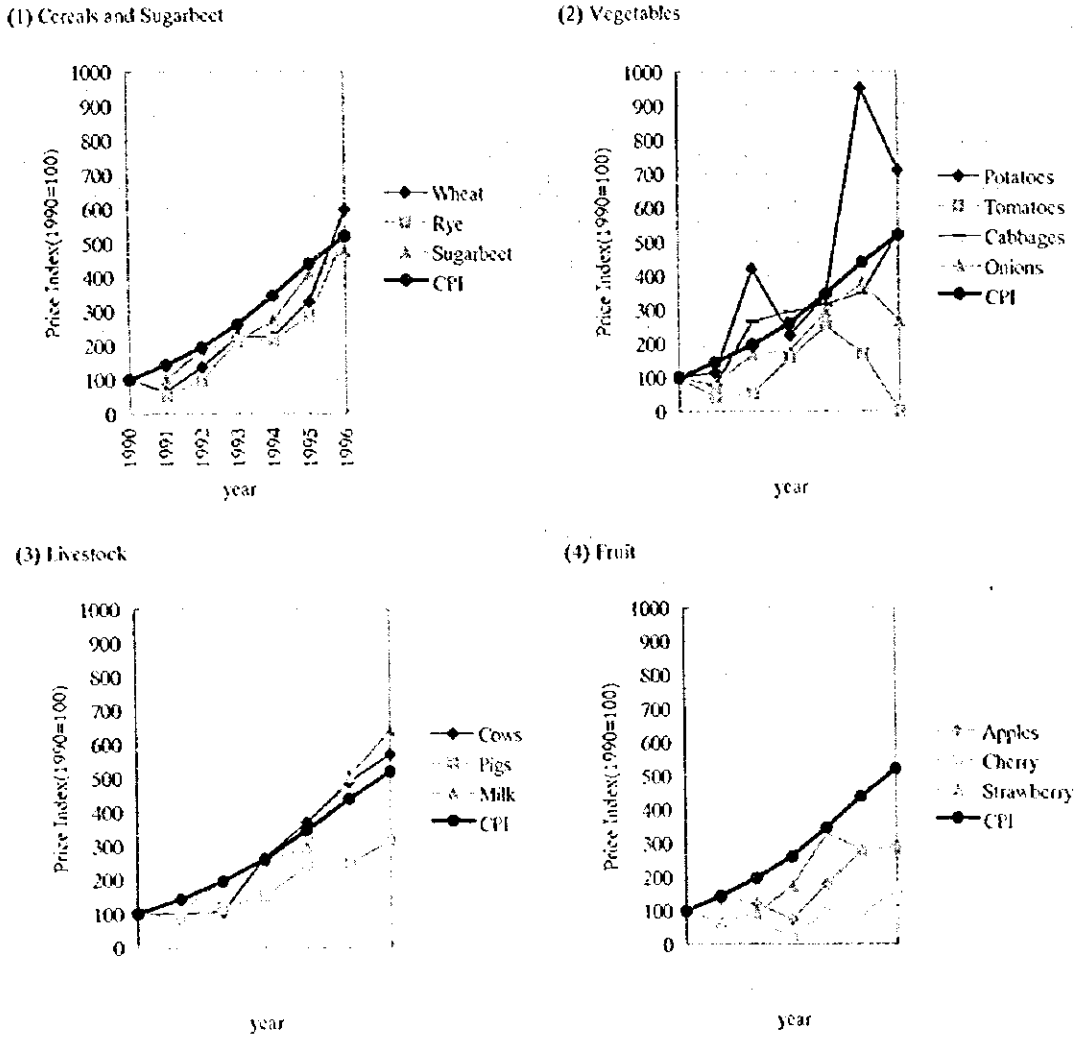
Source: Konin Statistical Office, Ministry of Agriculture

1.2.5 Marketing Issues

Presently, except for sugar beets, agriculture markets are principally liberalized. Cereals (wheat and rye for human consumption), meat and milk markets have occasional intervention by the state (The Agricultural Market Agency) for the purpose of stabilizing the agricultural and food markets. The agency purchases and sells produce on domestic and foreign markets in order to balance supply and demand, and accumulates strategic reserves.

Figure 1.2-4 (1) to (4) shows relationships between farmgate prices of major agriculture produce and retail prices (CPI). Prices are expressed in indices after adjusting impacts of inflation rates. Vegetable and fruit procurement systems were fully liberalized, which resulted in bigger fluctuations of production as well as prices compared with cereals and livestock produce. Such phenomena are typically observed in Figure 1.2-4 (2). Regarding milk, farmgate prices of cows and milk increased faster than CPI increasing rates, due to the recent decrease in numbers of cows (Figure 1.2-4 (3)). Figure 1.2-4 (1) shows farmgate prices of cereals and sugar beets. Prices have basically showed an increasing trend which was realized partially by the market intervention by the government. Therefore, production of cereals shows relatively stable increases compared with vegetables and fruit.

Figure 1.2-4 FARMGATE PRICES OF MAJOR AGRICULTURE PRODUCE AND CPI



Source: Calculated by the Study Team based on data from Konin Statistical Office and GUS(CPI)

(1) Cereals

In 1997 (up to 31 December 1997), the amount of wheat and rye for human consumption procured by ARR was 19,400 tons compared with the total production of 301,000 tons. The rest was either purchased by other buyers such as bakeries or, Gmina cooperatives or stored in farm storage facilities. According to a questionnaire survey regarding cereal procurement, the shares of the state procurement companies (state units and collective units) are still high compared with other selling channels as shown in Table 1.2-

12. The first column shows the size of farm land. On average, about thirty percent is used for production and ten to twenty percent is for self-consumption according to farming operation size.

Table 1-2-12 SELLING CHANNELS FOR CEREALS

(Unit:%)

	Not Sold	State Units	Collec-tives Units	Markets	Retailers	Neigh-bors	Agents	Travelin g Traders	Export-ers	Other Buyers	Self-Consump-tion	Produc-tion Purpose
1-5 ha(43)	0.0	4.8	12.7	3.2	0.0	9.5	11.1	0.0	0.0	11.1	19.0	28.6
5 ha-(108)	0.0	9.9	11.2	8.7	1.9	5.6	9.3	1.2	0.0	14.9	9.9	27.3
Total(151)	0.0	8.5	11.6	7.1	1.3	6.7	9.8	0.9	0.0	13.8	12.5	27.7

Note: Figures in parenthesis are numbers of sample farms.
Source: The Farm Survey.

(2) Sugar beets

Regarding sugar beets, production is regulated according to law. Sugar markets have been regulated in terms of production quotas, minimum sales prices, export quotas and the amount of export subsidies. Producers of sugar beets are given prior production quotas by contracted sugar processing companies and predetermined volumes of sugarbeet are purchased at predetermined prices agreed on a year before.

(3) Vegetables and fruit

There is no market regulation or state intervention regarding vegetables and fruit. According to farm surveys and farm interviews, the share of self-consumption is higher than any other production profile due to difficulty in finding selling places and a lack of adequate storage facilities. Table 1.2-13 shows sales channels. The reliance on markets is higher for small-scale farms than larger ones, whereas the shares of state units and collective units are higher in the case of large-scale farms.

Table 1.2-13 SALES CHANNELS FOR VEGETABLES AND FRUIT

(Unit:%)

	Not Sold	State Units	Collec-tives Units	Markets	Retailers	Neigh-bors	Agents	Traveling Traders	Export-ers	Other Buyers	Self Consump-tion	Produc-tion Purpose
1-5 ha(38)	5.2	1.7	6.9	12.1	3.4	5.2	13.8	1.7	1.7	6.9	22.4	19.0
5 ha-(93)	12.1	3.0	12.1	3.8	4.5	6.1	10.6	2.3	3.0	9.8	20.5	12.1
Total(131)	10.0	2.6	10.5	6.3	4.2	5.8	11.6	2.1	2.6	8.9	21.1	14.2

Note: Figures in parenthesis are numbers of sample farms.
Source: The Farm Survey.

(4) Livestock

Livestock produce markets have occasional intervention by the government for purposes of market stabilization and strategic reserves accumulation. Regarding dairy products, some cooperatives have contract production systems with member producers. In Konin, there are 5 such dairy cooperatives which procured 67.4 percent of the milk produced in Konin Province in 1997. About 90 percent of producers (17,200 farms) are selling milk to these dairy cooperatives. Some intervention is conducted in the cases of meat and milk, too. Due to inadequate storage facilities and transportation means, many producers use agents who transport the produce to processing companies as shown in Table 1.2-14.

Table 1.2-14 SALES CHANNELS FOR LIVESTOCK

(Unit:%)

	Not Sold	State Units	Collec-tives Units	Markets	Retailers	Neigh-bors	Agents	Traveling Traders	Export-ers	Other Buyers	Self-Consu-mption	Produc-tion Purpose
1-5 ha(40)	0.0	5.8	5.8	0.0	5.8	1.9	38.5	11.5	0.0	17.3	13.5	0.0
5 ha-(119)	0.0	15.8	6.4	4.7	2.3	2.3	38.6	7.0	2.3	14.6	4.1	1.8
Total(159)	0.0	13.5	6.3	3.6	3.1	2.2	38.6	8.1	1.8	6.3	6.3	1.3

Note: Figures in parenthesis are numbers of sample farms.
Source: The Farm Survey.

1.2.6 Export of Agricultural Produce

Table 1.2-15 shows produce exported from Konin Province from 1991 to 1996. Compared with production, the export ratio is still low. Besides, fluctuations in export volume indicate that produce was exported on an ad hoc basis rather

than a constant export contract basis. Fruit and vegetables were exported as fresh goods, but no dried fruit and vegetables were exported during that period.

Table 1.2-15 EXPORT OF AGRICULTURE PRODUCE FROM KONIN PROVINCE

	Unit	1991	1992	1993	1994	1995	1996
I.Propagation material							
1.Seeds							
Cereals	ton	0	0	0	0	0	0
Grasses	ton	525	667	605	132	158	268
Leguminous crops	ton	13	74	89	201	82	175
Rapeseeds	ton	0	0	0	38	1,022	0
Vegetables	ton	0	1	0	0	4	0
Flowers	ton	0	0	0	0	0	0
Herbs	ton	0	0	0	29	0	0
2. Cutting Produce							
Fruit trees and shrubs	pieces	110	14,070	1,400	45	3,100	0
Ornament trees and shrubs	pieces	5,160	16,520	30,325	3,920	32,530	70,239
Forest trees and shrubs	pieces	0	46,600	0	2,340	0	600
Flowers	pieces	0	20	23,506	32,600	0	0
3. Plant for reproduction(cuttings, rootstocks)		0	0	0	0	0	0
4. Onions, Onionbulbs, tubers, rootcrops	ton	0	42,800	0	0	0	0
II. Consumer goods and industrial goods							
Fruit(fresh)	ton	1,280	587	1,886	889	1,379	487
Fruit(dried)	ton	0	0	0	0	0	10
Vegetables(fresh)	ton	5,516	4,652	1,781	2,158	1,155	1,364
Vegetables(dried)	ton	10	0	0	0	0	0
Potatoes	ton	761	1,906	180	62	1,908	442
Total Fruit and Veg.		7,567	7,145	3,847	3,109	4,442	2,303
Cereals and fodders	ton	1,371	23,972	40	0	0	0
Fibers and oil raw materials	ton	21	4,052	510	0	0	0
Pot plants	pieces	381,630	648,400	0	0	59,698	154,510
Cutting flowers	pieces	2,500	600	0	0	0	0
Wood	m3	1,962	796	469	0	89	327
Undergrowth and mashroom		0	0	0	0	0	0
Basement soil	ton	0	0	0	0	0	1
Others	ton	2,902	1,827	192	0	97	180

Source: State Plant Protection Inspection Servieve Voivodeship Inspectorate

1.2.7 Agriculture Support Systems

(1) Agriculture education and extension system in Konin

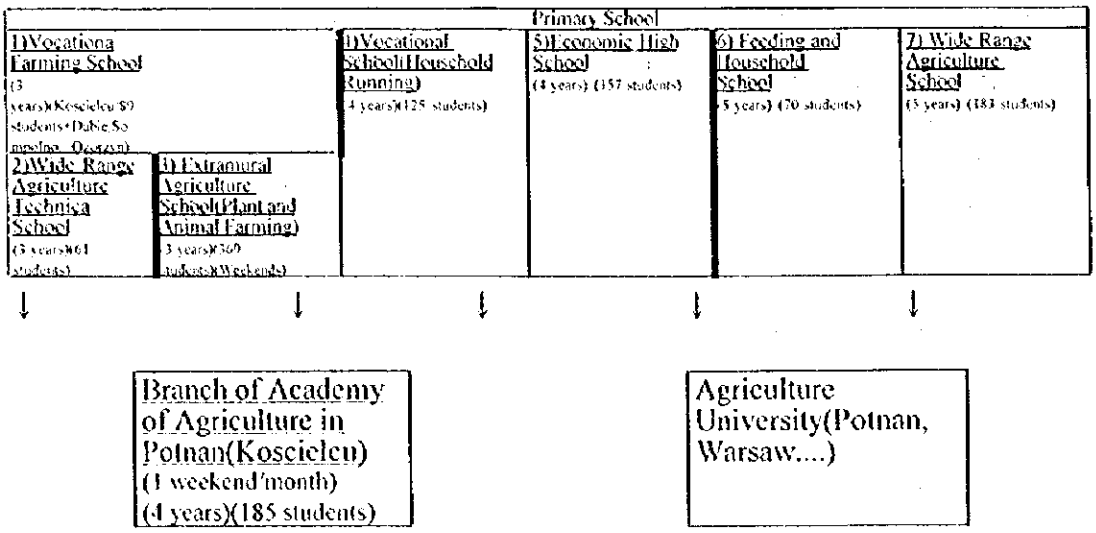
1) Agriculture education system

Basically, agriculture education and vocational training are conducted by agriculture schools and agriculture extension service centers (ODR). Experimental activities are conducted by state organizations. In Konin, there is a complex of agriculture schools and the headquarters of the ODRs in Koscielce which is regarded as a center of such functions.

There are seven complexes of agriculture schools in Konin Province; namely, Koscielce, Kaczki Srednie, Powiercie, Xzycmlin, Witkowo, Strzakkowo and Zagorow. Total number of students is about 4,000. Schools in Koscielce and Kaczki Srednie are providing a wide range of courses.

Here is an example of such a complex in Koscieelce. There are seven different levels of schools and a branch of the Academy of Agriculture on its 15 ha land (4 ha used for buildings). Total number of students is 1,054 except for those at the branch school of the Academy. Structures of schools are shown in the following Figure1.2-6.

Figure1.2-5 THE COMPLEX OF AGRICULTURE SCHOOLS IN KOSCIELCE



As Figure 1.2-5 shows, the Complex covers not only traditional agriculture subjects but rather diversifies its teaching subjects related to the market economy; namely, economics, agrotourism, agrobusiness and marketing.

2) Education and extension services for adults

Education and vocational training (extension services) outside schools for rural people are mainly conducted by ODR. The Ministry of Agriculture and Food Economy financed ODR's budget through the office of the Konin Governor. Total budget is 2,227,186 PLN in 1997, which accounts for 13 percent of the total agriculture budget (16,885,958 PLN.) of the office. Salaries and social security for employees account for 77 percent of the total budgets.

ODR has a policy to train people to be leaders of future agriculture production. There is a headquarters office in Koscielce with staff members of 24[2]. Apart from the headquarters, there are 7 regional group leaders covering 7 regions and 48 specialists each at Gmina and 13 to 14 women staff members at rural households. Most specialists are university graduates and not rotated to other Gmina often, as they need to be a specialist of a particular Gmina.

Training is provided to producers at three levels: Gmina, regions and the headquarter in Koscielce. Producers can access ODR at a regular meeting held every Monday at each Gmina. Regional groups arrange field trips to other provinces once a year in order to show producers successful operations.

3) Experimental services

Experimental activities were separated from ODR in 1990, and currently the Experimental Station of Species Appraisal, which is a branch office of Potnan, is conducting that role. It has 20 ha of experimental farms and 3

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[2] No. of Specialists and employees at ODR Koscielce : plant protection: 1, animal husbandry: 2, machinery: 1, ecology: 1, orchard/fruit/vegetables: 1, economic and market analysis: 7, publication: 3, school education: 1, rural household: 1, accounting: 4, and drivers: 2

staff members. They recommend species after testing varieties. It is directly controlled by the central government. ODR is also conducting experimental activities on farmlands.

(2) Social insurance

Presently, 46,456 persons receive agricultural pensions in Konin Province. Producers who are more than 65 years old in the case of men and 60 years old in the case of women have the right to receive the pensions if they have paid insurance to KRUS, for at least 100 quarters (25 years) with 16 years of farming operation 97 percent (218,984,252.21 PLN) of the total budget 214,640,463 PLN. Came from the state budget in 1996.

If producers cease agriculture production due to dispossession or sale of land with reasonable causes or reasons beyond their control, they can receive pensions if a minimum 50 quarters (12.5 years) is insured. After selling land and starting to work in the nonagriculture sector, they are required to pay insurance to ZUS (Social Insurance Company). Presently, there is no exchange system between KRUS and ZUS; therefore, money paid to KRUS is not transferred to ZUS once producers stop agriculture production and move to another sector. Besides, in order to receive the pension, farmers should hold on to their land. These rules make many of them reluctant to sell their land.

1.2.8 Environmental Issues

(1) Laws and systems for environmental protection

Table 1.2-16 shows the major laws and announcements by ministries which have been established in Poland for environmental protection. Since the establishment of the "Act concerning the protection and shaping of the environment" in 1980, various environmental standards and regulations have been set up. Fees and fines are imposed on anyone who is responsible for substances polluting air and water.

Table 1.2-16 MAJOR LAWS AND ANNOUNCEMENTS BY MINISTRIES ON THE ENVIRONMENT

Name of Law	Year of Establishment	Year of Recent Revision
Act concerning the protection and shaping of the environment	1980	1994
Announcement concerning the protection of the environment against noise and vibration	1980	
Announcement concerning environmental protection against waste and other pollution and keeping cities and villages tidy and in order	1980	
Announcement concerning the creating and use of protection zones	1980	
Announcement concerning detailed rules of ground surface protection	1987	
Announcement concerning the protection of air against pollution	1990	
Announcement concerning the charges for economic use of the environment and making changes in it	1993	
Announcement concerning the requirements for products in regard to the need for health and environmental protection	1994	
Announcement concerning the introduction of the obligation of observance of selected Polish standards for environmental protection, natural resources and forestry	1995	
Announcement concerning the designation of the kinds of investments harmful to the environment and human health and the evaluation of impact on the environment	1995	
Act concerning forests	1991	
Act concerning nature protection	1991	
Act concerning cultivated plant protection	1995	
Act concerning the protection of arable land and forests	1995	
Water law	1974	1997
Announcement concerning some watercourses for basic water amelioration facilities	1975	
Announcement concerning protection against flooding	1977	
Announcement concerning requirements which water for drinking and industrial use should fulfill	1977	
Announcement concerning supervision and control of water management	1977	
Announcement concerning water amelioration	1991	
Announcement concerning water classification and requirements which sewage introduced to water or soil should fulfill	1991	
Announcement concerning agricultural use of sewage	1986	

Source: National Inspection of Environmental Protection, Konin

(2) Status of environmental pollution

The environmental department in Konin and other institutions have been continuously examining the quality of surface water and ground water. Table 1.2-17 shows the results of the ground water quality test carried out at 25 sites in the province from 1993 to 1996.

Some of the elements exceed the environmental standard values. Many other elements, the values of which are not small even under the standard values, require regular monitoring. Ground water in the province is

considered to be polluted by the sewage from houses and industries and the waste materials include artificial fertilizers and animal excrement at farms.

Table 1.2-17 CURRENT SITUATION OF GROUND WATER IN THE PROVINCE - BASED ON THE WATER QUALITY TEST DATA FROM 1993 TO 1996

Description	Measured Value	Standard Value of Class III
Odor	Z1R, Z2R, Z1G	natural
pH	7.0 - 8.0	6.0 - 9.0
$N\text{-}NH_4$	0 - 1.36 mg/l	6.0 mg/l
$N\text{-}NO_3$	0 - 2.4 mg/l	15.0 mg/l
$N\text{-}NO_2$	0 - 0.1 mg/l	0.06 mg/l
PO_4	0 - 1.4 mg/l	1.0 mg/l
Cl	4 - 490 mg/l	400 mg/l
SO_4	0 - 142 mg/l	250 mg/l
Na	5.2 - 68.2 mg/l	150 mg/l
K	0.55 - 6.2 mg/l	15 mg/l
Soluble substance	171.120 mg/l	1200 mg/l
Fe	0 - 3.3 mg/l	2.0 mg/l
Zn	0 - 2.09 mg/l	0.2 mg/l
Cr	0 - 0.007 mg/l	0.1 Cr^{3+} mg/l
		0.05 Cr^{6+} mg/l
Cd	0 mg/l	0.1 mg/l
Mn	0 - 0.38 mg/l	0.8 mg/l
Cu	0 - 0.08 mg/l	0.05 mg/l
Ni	0 mg/l	1.0 mg/l
Pb	0 - 0.017 mg/l	0.05 mg/l
F	0.08 - 0.86 mg/l	2.0 mg/l
H_2S	0 mg/l	0.1 mg/l
Phenol	0 - 0.021 mg/l	0.05 mg/l

Source: National Inspection of Environmental Protection, Konin

(3) Environmental problems as related to agriculture in the province

The environmental problems as related to agriculture in the province can be described as follows.

a) Because the ground water is drained from open-cut lignite mining sites, the ground water table is lowered at farmland around the sites. Water supply for farmland is impaired.

b) Surface water and shallow ground water are polluted by the sewage from industries, which is worsening irrigation water quality. The air, soil and water pollution by fluoride and dust discharged from aluminum plants has been improved, but the pollution has not been resolved.

c) Waste materials from livestock farms are polluting surface water and shallow ground water around farmland.
d) Too much usage of artificial fertilizers is polluting surface water and shallow ground water around farmland.
e) Because lake water is used for cycling cooling water at power plants, the ecosystem around the lakes is damaged. Also, artificial fertilizers from farmland cause pollution of lake water.

Responding to these, there is a existing program and future possibilities related to environmental issues as follows.

a) The afforestation program has made a plan for planting 31,764ha of farm land with trees.
b) The refilled land at coal mining sites could be used not only for tourist attraction but also as farmland. As the experimental cultivation of sugar beets on refilled land is showing higher productivity than other farmland, agriculture of high productivity could be located on refilled land.

(4) Environmentally friendly agriculture (organic farming)

Organic farming is included in the framework of the economic development programmers for Poland. However, it is still in its early stage of development[3] and the actual organic farming practices are ahead of the administrative activities directed toward development of such farming methods. There is no uniform regulation on functioning organic farming and no national control system, which makes it difficult to certify and control organic farms.

Presently, the state finances a project on "Designing the model of development and functioning of organic farming" which will introduce organic farming practices in accordance with international formal and legal requirements. At the same time, the Polish Center for Testing and Certification is responsible for testing and certificating goods and services as a national organization. It covers a range of activities which include organizing and supervising the system of testing and certification,

[3] Presently, 0.03 percent of total land is used for organic farms and 306 farms are registered as organic farms in Poland

accrediting certifying units, controlling the accredited certifying units, and organizing training and improving skills of personnel.

By the end of 1998, the draft of the Act on organic farming is expected to be prepared in the process of adjusting the Polish law to the directive of the EEC Council. The draft will include principles of production utilizing organic methods such as production means and fertilization methods, plant protection methods, processing and labeling organic produce, and controlling operations of organic farms.

1.3 A Farm Management Analysis in Konin Province

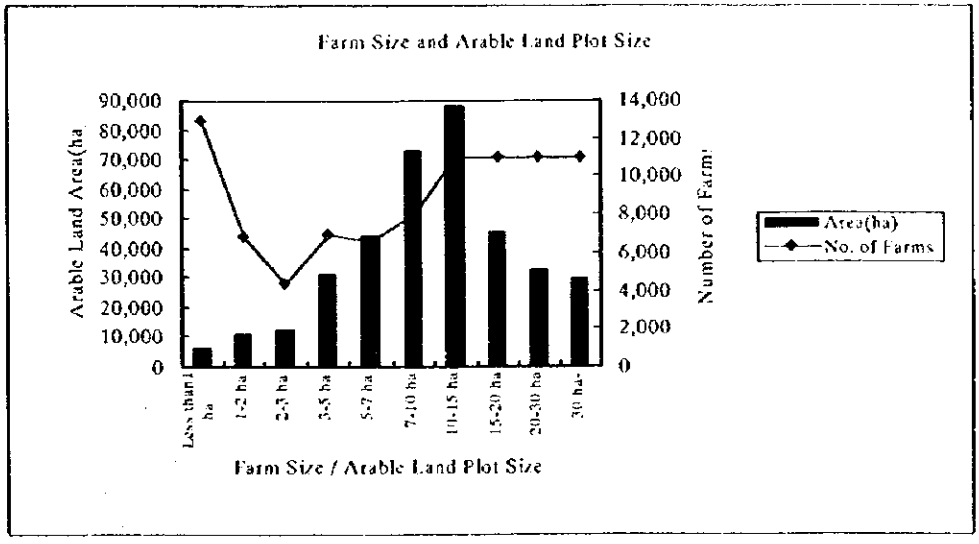
In this section, farm management in Konin Province is analyzed based on field surveys and the questionnaire survey. The analysis of the questionnaire survey is shown in sections 1.4 and 1.5

1.3.1 General Characteristics of Farming Operations in Konin Province

(1) Land size per farm

Presently, two directions of land-holding size are observed: enlargement and reduction of land size. On average, there is an increasing trend in land size. In 1996 average land size was 8.35 ha, which was increased by 1.05 ha from 7.3 ha in 1988. However, the number of small scale farms with less than five ha had also increased to 31,164 farms (55 percent of total farms) in 1996 as Figure 1.3-2 shows. One reason for this decreased land size per farm is that land was divided into small pieces when children inherited. For example, the number of farmers who own less than 1 ha of land is 12,935 out of 43,809 farms.

Figure 1.3-1 FARM SIZE AND AREAS OF ARABLE LAND BY PLOT SIZE



Note: Total number of farms with more than 10 ha of land is 10,963 farms. No further detailed numbers are available.

Source: The Konin Statistical Office

Table 1.3-1 compares farming operation size per farm between the 12 European Union countries and Konin. Enlargement of land size has been promoted in major agricultural countries as the number of farms which have more than 50 ha of land has almost doubled since 1980. Konin's average land size is the same as that of the Italy and its high ratio of farms with less than five ha is similar to Spain. The share of farms with more than 50 ha of land is 0.2 percent in Konin Province.

Table 1.3-1 COMPARISON OF FARM SIZE BETWEEN 12 EU COUNTRIES AND KONIN/POLAND

(Unit:%) (ha)

	Year	1-5 ha	5-10 ha	10- 20 ha	20-50 ha	50 ha -	Average Size
Belgium	1980	28.0	20.0	27.0	21.0	4.0	15.4
	1993	34.0	15.0	19.0	25.0	7.0	18.0
Denmark	1980	11.0	17.0	27.0	35.0	10.0	26.5
	1993	2.0	16.0	23.0	36.0	22.0	37.2
France	1980	20.0	15.0	21.0	31.0	13.0	25.4
	1993	27.0	10.0	13.0	26.0	24.0	35.3
Greece	1980	72.0	20.0	6.0	2.0	0.0	4.6
	1993	68.0	20.0	9.0	3.0	1.0	5.4
Spain	1980	56.0	18.0	12.0	9.0	5.0	15.3
	1993	55.0	18.0	12.0	9.0	6.0	18.0
Netherlands	1980	24.0	20.0	29.0	24.0	3.0	15.6
	1993	33.0	17.0	19.0	26.0	6.0	17.2
Ireland	1980	15.0	12.0	30.0	30.0	9.0	22.6
	1993	10.0	14.0	29.0	35.0	12.0	26.4
Luxembourg	1980	19.0	11.0	15.0	38.0	17.0	33.2
	1993	26.0	9.0	9.0	23.0	34.0	36.6
Germany	1980	34.0	17.0	23.0	20.0	4.0	15.3
	1993	30.0	17.0	20.0	25.0	9.0	18.6
Portugal	1980	78.0	13.0	5.0	2.0	2.0	8.9
	1993	78.0	11.0	6.0	3.0	2.0	7.4
United Kingdom	1980	12.0	12.0	16.0	27.0	33.0	68.7
	1993	11.0	13.0	16.0	26.0	34.0	69.9
Italy	1980	68.0	17.0	9.0	4.0	2.0	8.0
	1993	67.0	16.0	9.0	5.0	2.0	8.6
Poland	1996	55.3	25.2	15.1	3.7	0.4	7.0
Konin	**1996**	**55.0**	**26.0**	**19.0**			**8.4**

Source: Evaluation of Changes in Rural Areas, in Agriculture and Food Industry in the Years 1988-1996 Ministry of Agriculture and Food Economy, The Konin Statistical Office

(2) Production profile according to land size

Table 1.3-2 shows the production profile of crop production per farm size. Wheat, rye and potatoes account for 70 to 80 percent regardless of farm size. However, the share of fruits and vegetables is higher on farms with less than 3 ha, whereas the shares of fodder crops and industrial crops are higher on medium and large-scale farms. Maize is mainly produced by farms with more than 15 ha. This implies that many livestock producers produce fodder by themselves. Table 1.3-3 shows types of livestock produced according to farm size.

Table 1.3-2 LAND USE ACCORDING TO FARM SIZE IN 1996

	Wheat, Rye, Potatoes	Vegetables	Fruits	Maize	Fodder Crops	Sugar	Industrial Crops
below 3 ha	80.6%	6.0%	6.4%	0.2%	3.5%	2.9%	1.7%
3.0 to 6.9 ha	82.1%	1.5%	2.3%	0.4%	5.9%	0.9%	4.0%
7.0 to 9.9 ha	79.7%	1.3%	1.4%	0.5%	6.4%	0.4%	5.4%
10.0 to 14.9 ha	76.1%	1.2%	1.3%	0.6%	6.8%	0.4%	7.1%
above 15 ha	70.9%	1.3%	2.0%	2.6%	7.8%	0.6%	8.6%

Source: The Konin Statistical Office

Pigs are the main production item in the livestock sector. The greater the land size, the greater the share of pig, cattle and cow production, as a certain amount of land is required for breeding[1]. Poultry production is conducted mainly by smaller-scale producers.

[1] According to farm interviews, ten ha of land is needed for breeding 20 pigs and one ha is needed for breeding one cow.

Table 1.3-3 TYPES OF LIVESTOCK ACCORDING TO FARM SIZE IN 1996
(Unit: heads/sticks)

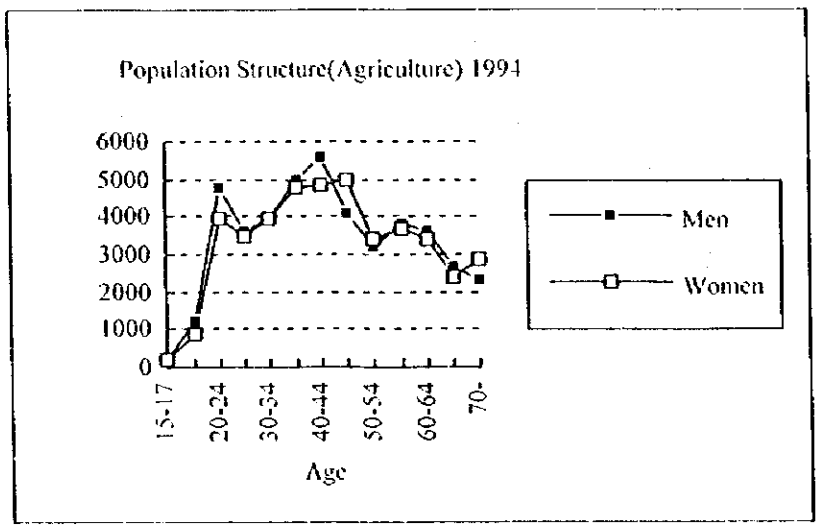
	pigs	cattle and cows	sheep	poultry
below 3 ha	18,910	4,233	213	166,973
3.0 to 6.9 ha	69,392	25,911	444	197,859
7.0 to 9.9 ha	83,663	32,740	544	148,414
10.0 to14.9 ha	111,897	43,900	1,060	144,418
above 15 ha	145,647	49,635	4,507	137,392

Source: The Konin Statistical Office

(3) Structure of producers

Agriculture producers account for 43 percent of the working population. In rural areas, 29 percent of the population is under working age and 13.9 percent is more than 60 years old. As of 1994, the working population under the age of 39 accounts for 41 percent of total agriculture population.

Figure 1.3-2 POPULATION STRUCTURE (AGRICULTURE) 1994



Source: The Konin Statistical Office

1.3.2 Farm Management Analysis

Table 1.3-4 summarizes the results of the questionnaire survey. General problems of farm management are considered to be the following two issues.

a) Productivity (yields, labor and land productivity) is low.
b) Profitability of a farming operation is not high enough to accumulate earnings necessary for new investment including diversification of production profile and modernization of farming practices.

The situations differ among farming operation sizes, and generally the situations of large scale producers are better than the smaller ones as shown in Table 1.3-4.

(1) Productivity

Productivity is greatly influenced by natural and climatic conditions such as low quality of soil and inadequate water supply, as already discussed in section 1.2. In this section, low productivity issues are discussed from farming practices point of view.

1) Usage of agricultural input

Artificial fertilizers are crucial production input in Konin, where poor soil quality is one of the serious constraints on improvement of productivity. Table 1.3-5 shows the recent trend of utilization of artificial fertilizers. After the reform in 1989, the usage of nitrogenous, potash and phosphor fertilizers dropped sharply as a result of abolishment or reduction of various subsidies for fertilizers. Total consumption of artificial fertilizers dropped from 183.6 kg/ha in 1988 to 88.9 kg/ha in 1996. The decreased usage of artificial fertilizers prevents, in a sense, not only sharp increase in production but also worsening of environmental pollution.

Table 1.3-4 RESULT OF THE QUESTIONNAIRE SURVEY

	Profitability	Productivity (unit sales)			Technology	Marketing
		Yield (ton/ha)	Land (Pl.N/ha)	Labour (Pl.N/manday)		
Small (less than 5ha)						
cereals	operating loss	yields of fodder crops and rye are higher for farms with less than 5ha	land productivity is the lowest among 4 types of farming operation	labour productivity is lower than with more than 5ha farms	1) farms are not well mechanized 2) efficiency of farming practices is not high 3) installation of on-farm irrigation is not promoted	50% of produce is used for self consumption and production purposes
livestock + cereal	operating loss		land productivity is not so different	labour productivity is lower than larger scale farms	- do -	
livestock	operating loss		land productivity is the highest for farms with less than 5ha	labour productivity is high for farms with less than 5ha	- do -	70% of produced is sold, the share of agents is almost the same as that of larger scale farms
vegetables and fruit	operating loss	highest yields: potatoes (1-3ha). Vegetables (0-1ha) fruit (3-5ha)	highest for farms with 1-3 ha of land	labour productivity is the lowest among 4 types of farming operation	- do -	more than 40% of produce is not sold (self consumption, production purpose). reliance on markets is high
Large (more than 5ha)						
cereals	farms with more than 30ha achieve the highest profitability	yields of wheat, barely and sugarbeet are higher for farms with more than 5ha	land productivity is the highest for farms with 10-20ha	labour productivity is higher for farms with more than 20ha	1) large scale farms are more mechanized 2) efficiency of farming practices is high 3) installation of on-farm irrigation facilities is not	farms with 20ha use 30% of produce for production purposes. farms with more than 30ha. have capacity to sell outside of farms
livestock + cereal	farms with more than 40ha achieve the highest profitability		land productivities are highest for farms with 5-10ha	labour productivities are higher for farms with more than 15ha	- do -	
livestock	farms with 10 to 15ha of land achieve the highest profitability		not so much clear differences exists among different operation size	labour productivity is high for farms with more than 20ha	- do -	almost 100% of produce is sold by farms with 20 to 30ha
vegetables and fruit	farms with more than 7ha obtain profits		land productivity differs by farms.	farms with 5-7ha achieve the highest labour productivity	- do -	self consumption rates are lower than small scale farms. selling channels are diversified

Table 1.3-5 RECENT TREND IN THE USE OF ARTIFICIAL FERTILIZERS

Type		Unit	Year								
			1988	1989	1990	1991	1992	1993	1994	1995	1996
N-Fertilizer	Konin	t	29,627	25,811	12,299	12,182	15,524	18,931	23,434	24,809	26,348
		kg/ha	78.7	68.8	32.9	32.6	41.5	50.6	63.8	71.0	73.6
	Poland	kg/ha	82.0	68.9	39.9	33.9	37.7	42.0	46.6	47.1	49.9
P2O5-Fertilizer	Konin	t	18,870	13,812	5,841	3,361	5,263	5,645	6,192	5,592	6,073
		kg/ha	50.1	36.8	15.6	9.0	14.1	15.1	16.9	16.0	16.9
	Poland	kg/ha	50.9	40.7	22.3	12.2	12.8	13.5	15.5	16.7	17.3
K2O-Fertilizer	Konin	t	20,612	18,121	8,571	4,917	4,372	5,139	5,324	4,356	4,720
		kg/ha	54.8	48.3	22.9	13.2	11.7	13.7	14.5	12.5	13.2
	Poland	kg/ha	62.6	54.3	32.9	16.0	15.3	15.6	17.6	19.8	21.1
Total Artificial Fertilizer	Konin	t	69,109	57,744	26,711	20,460	25,159	29,715	34,950	34,757	37,141
		kg/ha	183.6	153.9	71.4	54.8	67.3	79.4	95.2	99.5	103.6
	Poland	kg/ha	195.5	163.9	95.1	62.1	65.8	71.1	79.7	83.6	88.9
CaO-Fertilizer (Including MgO-Fertilizer)	Konin	t	44,476	35,660	12,996	18,523	21,967	29,563	43,011	42,912	44,415
		kg/ha	118.1	95.0	34.7	49.6	58.8	79.1	117.1	122.9	123.9
	Poland	kg/ha	202.2	182.4	139.0	117.2	115.2	104.7	131.9	123.1	139.0
Fertilized Area	Konin	ha								349,260	

Source: The Konin Statistical Office

On the other hand, too much dosage with artificial fertilizers sometimes harms the growth of crops, causes diseases and threatens food safety, and pollutes the environment. In Konin, nitrogenous fertilizers are more intensely used compared with the national average, which reduces pH of soil, reduces alkaline substances, and unbalances nutritional contents in soil. As one method to resolve them, the use of organic fertilizers is recognized to be effective. It can help the activation of microorganisms in soil and improve soil conditions. At the same time, it contributes to the improvement of water-holding capacity, drainage and aeration of soil. Though many livestock farms produce organic fertilizers, most of livestock farms use them for themselves and do not give or sell them to other farms at present. Table 1.3-6 shows the number of farms using organic fertilizers.

Table 1.3-6 USE OF ORGANIC FERTILIZERS IN THE PROVINCE

Type of farm	Land size	Total number of samples	Farms which are using organic fertilizers	
			(nos)	(%)
Cereals or Livestock and cereals	less than 10ha	57	48	84.2
	more than 10ha	66	62	93.9
	Total	123	110	89.4

Source: Questionnaire Survey

2) Use of machinery and facilities

Mechanization enables producers to reduce losses, improve quality and save working time. The present status of agricultural machinery and facilities (especially storage and greenhouses) is different between large farms and small farms. Also, the status of their maintenance differs among farms.

The total number of machines used by farms is gradually increasing. For example, the average cultivation area for one tractor has been diminishing in recent years (see Table 1.3-7), and the number of tractors used by farms in Konin province increased by approximately 26% in the 8 years from 1988 to 1996.

Table 1.3-7 CULTIVATION AREA FOR ONE TRACTOR (ha)

Province	Year	
	1988	1996
Konin	17.0	13.0
Poland	17.0	14.5

Source: Konin Statistical Office

Table 1.3-8 shows the situation of tractors, trucks and combines. Though the number of machines is increasing, the proportion of actual extension is still at a low level.

Table 1.3-8 STATUS OF USE OF TRACTORS AND COMBINES IN KONIN PROVINCE IN 1996

Machines	Total number of used machines (nos)	Number of mechanized farms (household)	Ratio of mechanized farms (%)	Remarks
Tractor	27,902	23,690	54.8	
Truck	3,165	2,778	7.5	
Combine for wheat	1,887	1,848	4.3	4.5% of cereal cultivation farms
Combine for beets	652	651	1.5	8.3% of beet cultivation farms
Combine for potatoes	1,894	1,886	4.3	5.3% of potato cultivation farms

Note: The number of individual farms in Konin province in the year 1996 is 43,809.
Source: The Konin Statistical Office

Table 1.3-9 shows the difference of farms' mechanization by land size per farm. The table shows that farms with larger farmland are more mechanized than farms with smaller farmland.

Table 1.3-9 DIFFERENCE OF FARMS' MECHANIZATION BY LAND SIZE PER FARM

Unit: numbers (%)

Machines	Land Size per Farm (ha)						
	Total	- 5	5 - 10	10 - 15	15 - 20	20 - 50	50 -
Tractor	23,690 (54.1)	3,812 (20.9)	9,752 (66.7)	6,068 (89.9)	2,359 (95.2)	1,602 (98.0)	97 (94.2)
Truck	2,778 (6.3)	967 (5.3)	728 (5.0)	441 (6.5)	275 (11.1)	309 (18.9)	56 (54.4)
Combine for wheat	1,848 (4.5)	41 (0.6)	248 (1.7)	455 (6.8)	383 (15.6)	646 (40.1)	75 (73.5)
Combine for beets	651 (8.3)	4 (0.5)	75 (2.5)	180 (8.2)	134 (14.0)	234 (31.8)	24 (63.2)
Combine for potatoes	1,886 (5.3)	17 (0.1)	206 (1.6)	603 (9.6)	467 (20.3)	559 (37.9)	34 (63.0)
Total No. of Farms	43,809	18,229	14,617	6,749	2,477	1,634	103
No. of Farms Cultivating Cereals	41,447	6,622	14,333	6,689	2,455	1,611	102
No. of Farms Cultivating Beets	7,801	876	3,002	2,202	954	736	38
No. of Farms Cultivating Potatoes	35,265	12,041	13,104	6,284	2,306	1,476	54

Source: The Konin Statistical Office

Note: Farm survey shows similar results as described below.

Type of farm	Land size	Total number of samples	Number of mechanized farms		
			Tractor	Truck	Combine
Cereals	less than 10ha	57	54 (95%)	7 (12%)	9 (16%)
or	more than 10ha	66	65 (98%)	11 (17%)	29 (44%)
Livestock and cereals	Total	123	110 (89%)	18 (15%)	38 (31%)

3) Status of field operations and management

There are many farms who cannot afford to buy needed machines and equipment, which prevents them from conducting efficient field operations. For instance, fruit production has been sometimes damaged by low temperature. One of the remedial measures is water spraying by sprinkler systems when the temperature decreases to a critical level where damage

can occur. However, this system is costly because water should be sprayed simultaneously over wide areas to protect against damage. Another measure is installation of electric fans which will blow wind in case of low temperature. Its cost is rather reasonable. Sprinkler systems and fan systems would protect against damage by warming air temperature around crops with sprayed water or wind. Also, alteration of cropping periods and selection of varieties would be effective alternatives.

In addition, individual farms have various ideas on new farming methods. However, such ideas are rarely extended to other farms as new knowledge. Farms are practicing various cultivation methods and using various facilities, especially in the case of cultivating vegetables and fruit trees which require considerate procedures. Farms with a larger scale of land have advantageous conditions for water management by developing irrigation facilities, cultivation procedures, utilization of manure practices, pest and disease controls, and maintenance of machinery and facilities.

4) Status of support service systems

Few organizations have been established for services such as supplying agricultural materials and machinery. However, as services provided do not always meet the farms' demands, productivity improvement and modernization of agriculture are limited.

(2) Profitability

1) Cereals

Presently, cereals are produced by many farms regardless of land size in Konin as shown in Table 1.3-2. The main purposes are self-consumption and production. Farm gate prices of cereal is lower than other types of produce, and most farms cannot cover production costs such as fuels, fertilizers and seeds, as well as various service costs including machinery and hired labor. As a result, profitability becomes lower and it is hard to make profits with cereal production alone.

On the other hand, it is not a labor-intensive farming operation compared with other types of produce such as vegetables and fruit, and an extensive farming operation can be implemented over large areas. The economies of

scale in terms of production of wheat, barley and sugar beets is realized as shown in Figures 1.5-4 to 1.5-6 of the questionnaire survey. According to the questionnaire, survey land size which brings cereal producers the highest profits is more than 30 ha.

In order to improve the profitability of a farming operation, it is necessary for cereal producers to enlarge production scale to enable mass production. The farming style needs appropriate mechanization.

2) Livestock

In the case of livestock farms, high input costs directly affect profitability. According to the questionnaire survey, on average, costs for feed/fodder account for 33. 6 percent of total expenditures, followed by fuels (10 percent) and breed (10 percent) as shown in Table 1.5-2. As a result, the average net agriculture profit rate is 8.3 percent, which is the lowest among the four types of farming operations studied in the questionnaire survey. Therefore, mixed farms, which breed animals as well as produce feed or fodder by themselves as widely observed in Konin Province, achieve more profitable farm management as Table 1.5-2 shows.

Taking into account the net profit ratio of 8.3 percent to total sales, farms cannot accumulate earnings which are needed for investment for improving quality. In this regard, problems of livestock farming are 1) high cost structure of production methods, and 2) small profit margins. In order to improve profitability, introduction of production technology which reduces costs and improves quality is needed. Obsolete machinery which is used as based on energy-intensive production methodology also needs to be replaced.

3) Vegetables and fruit

Among plant production, profitability of vegetables and fruit is higher than that of cereals according to the questionnaire survey (see Table 1.5-2). However, the range of fluctuations in farmgate prices of vegetables and fruit is bigger than those of cereals and livestock, which have occasional intervention by the government. Therefore, sales are easily affected by market demand and supply conditions.

Labor costs affect management. According to the questionnaire survey, average vegetable and fruit farms (4.37ha) use 556.09 mandays per year, whereas the figures are 333.53 mandays for livestock farms (10.09ha), 281.77 mandays for cereals (10.41ha) and 308.23 mandays for mixed farms (11.24ha). Being a labour intensive farming, the average share of expenditures for a hired labor force is the highest among different production profiles at 17 percent of total expenditures. How to reduce labour costs becomes an import and task for vegetables and fruit products[2]. Other major cost items the questionnaire survey are fuels (27 percent of total expenditures) and pesticides (11 percent).

The questionnaire survey also implies that, unlike cereals, land productivity is not so different among small and large farms.

In order to increase profitability, three points need to be considered.

a) A year-round operation (find business opportunities during winter seasons)
b) Avoid negative influences caused by price fluctuations as much as possible
c) Reduce labor costs as much as possible

(3) Land size per farm and farm management

In terms of **Profitability**, farms with less than five ha show a negative profit regardless of different production profiles as shown in Figure 1.5-2 (1) to (4). Therefore, such small-scale farms depend more on nonagriculture income sources than larger ones as shown in Table 1.5-3. Regarding **Efficiency** of farm management, there is a positive correlation between land size per farm and efficient usage of assets as Figure 1.5-3 shows. There is also a positive correlation between **Productivity** of cereals and sugar beets and land size. However, the economies of scale in terms of production are not observed in the case of vegetables and fruit as Figure 1.5-6 shows.

[2] A vegetable farm with 6ha of land and selling relatively high-value produce such as broccoli and cauliflower cannot hire an appropriate worker by paying four PLN per hour during the harvesting period.

(4) Land size per farm and marketing

Land size, in other word farming operation size, affects the marketing possibility as well. Figures 1.5-8 to 1.5-10 imply that the smaller the land size, the greater the dependency on agents and traders. In addition, even though livestock and cereals are occasionally purchased by the state, small-scale farms utilize such an opportunity less than large-scale farms as small shares of state and collective units indicate.

(5) Inadequate access to markets and high rates of self-consumption

Many producers pointed out "low selling prices " and "lack of markets" as the most important problem as shown in Figure 1.5-14. As a result, produce which is sold outside of farms is limited. Figures 1.5-8 to 1.5-10 show that except for livestock, a large share of produce is either utilized for production purposes or for self-consumption. Average calculated self-consumption rates are more or less 40% in the cases of crop production as shown in Table 1.5-5.

(6) Producer groups

Presently, group activities are rarely seen in Konin province, and only 11 out of 200 farms join such groups as shown in Table 1.5-6. Major activities currently observed within the limited samples are common usage of machinery and purchase of agriculture inputs. However, reflecting difficult marketing situations, the need for forming producer groups for selling as well as purchasing purposes is high as Figure 1.5-12 shows.

(7) Credit

About 50% (112 out of 200 farms) of sample farms borrowed money mainly from cooperative banks. "High interest rates" and "time-consuming procedures associated with applying for credit" are two important constraints preventing producers from borrowing money. The need for working capital for plant production comes first as credit purposes followed by machinery and land purchase. Most farms provide land plus other assets as collateral to financial institutions.

1.4 Questionnaire Survey - Agricultural Technology

1.4.1 Sampling

An additional questionnaire survey on farms was done in October to December 1997 for the purpose of clarifying the technological status of agriculture in the province.

Table 1.4-1 shows the number of samples for the questionnaire survey. Samples were selected equally from each area and from each Gmina, so that the situation of the whole province could be clarified by the survey.

Also, farms surveyed were selected among farms with less than 30ha of arable land. The arable land area which is owned by those farms is more than 90% of the total arable land in the province. Therefore, the sample farms will indicate the major part of the farming status in the province.

Table 1.4-1 NUMBER OF SAMPLES FOR THE SURVEY

Area	Gminas	Total No. of Samples	No. of Samples for each Gmina
Northeastern Area	Sompolno, Kramsk, Babiak, Osiek Maly, Kolo, Przedecz, Klodawa, Grzegorzew, Olszowka, Chodow, Grabow, Wierzbinek	55	4 or 5
Northwestern Area	Witkowo, Strzalkowo, Orchowo, Powidz, Wilczyn, Skulsk, Ostrowite, Kleczew, Slesin, Slupca, Ladek, Kazimierz Biskupi, Konin, Golina	41	2 or 3
Southern Area	Pyzdry, Zagorow, Rzgow, Grodziec, Stare Miasto, Rychwal, Krzymow, Koscielec, Wladyslawow, Tuliskow, Brudzew, Turek, Malanow, Dobra, Przykona, Kaweczyn, Dabie, Swinice Warckie, Uniejow	54	2 or 3
Total		150	

1.4.2 Profile of Sample Farms

(1) Cultivation area

Table 1.4-2 shows the cultivation area of sample farms. Average cultivation area of each type shows a little difference among the NE, NW and S areas, but this is not important for making a comparison among types and among areas.

Table 1.4-2 CULTIVATION AREA OF SAMPLE FARMS

Area	Type	Total Number of Samples	Number of Samples				Average Cultivation Area (ha)
			Cultivation Area				
			- 10ha	10 - 20ha	20 - 30ha	30ha -	
NE	cereals	14	10	2	1	1	10.6
	livestock and cereals	25	11	10	4	0	13.6
	livestock	2	2	0	0	0	4.0
	vegetable and fruit	14	9	5	0	0	7.4
	total	55	32	17	5	1	10.9
NW	cereals	13	5	4	1	3	15.7
	livestock and cereals	23	5	11	6	1	16.2
	livestock	0	0	0	0	0	-
	vegetable and fruit	5	4	0	1	0	7.8
	total	41	14	15	8	4	15.0
S	cereals	16	11	4	1	0	8.8
	livestock and cereals	32	15	12	3	2	13.4
	livestock	1	1	0	0	0	4.3
	vegetable and fruit	5	3	2	0	0	9.6
	total	54	30	18	4	2	11.5
Total	cereals	43	26	10	3	4	11.5
	livestock and cereals	80	31	33	13	3	14.3
	livestock	3	3	0	0	0	4.1
	vegetable and fruit	24	16	7	1	0	7.9
	total	150	76	50	17	7	12.2

(2) Farming practices

Table 1.4-3 shows the number of farms having irrigation facilities, practicing organic farming, and having specific machines. The table indicates that approximately 20% of sample farms have installed on-farm irrigation facilities. Also, almost all of the livestock-and-cereal farms are practicing organic farming. However, farms using organic fertilizers are also using artificial fertilizers, and there are no farms using only artificial fertilizers. Concerning farming machines, most of the farms have tractors.

Table 1.4-3 SPECIFIC FARMING PRACTICES AND MECHANIZATION OF SAMPLE FARMS

Area	Type	Total Number of Samples	Number of Farms				
			Having Irrigation Facilities	Practicing Organic Farming	Having Specific Machines		
					Tractor	Truck	Combine
NE	cereals	14	3	9	11	4	2
	livestock and cereals	25	4	25	25	0	10
	livestock	2	0	2	2	0	0
	vegetable and fruit	14	9	5	13	9	0
	total	55	16	41	51	13	12
NW	cereals	13	2	11	13	3	6
	livestock and cereals	23	2	23	23	4	13
	livestock	0	0	0	0	0	0
	vegetable and fruit	5	4	2	4	1	0
	total	41	8	36	40	8	19
S	cereals	16	1	11	15	1	1
	livestock and cereals	32	3	31	32	6	16
	livestock	1	0	1	1	0	0
	vegetable and fruit	5	2	1	5	3	0
	total	54	6	44	53	10	17
Total	cereals	43	6	31	39	8	9
	livestock and cereals	80	9	79	80	10	39
	livestock	3	0	3	3	0	0
	vegetable and fruit	24	15	8	22	13	0
	total	150	30	121	144	31	48

(3) Livestock farming

Table 1.4-4 shows the livestock farming profile of sample farms.

Table 1.4-4 LIVESTOCK FARMING PROFILE OF SAMPLE FARMS

Area	Type	Total Number of Samples	Pigs		Cattle and Cows		Poultry	
			Number of Farms	Average Heads per Farm	Number of Farms	Average Heads per Farm	Number of Farms	Average Heads per Farm
NE	livestock and cereals	25	24	54	20	18	3	377
	livestock	2	1	21	2	9	0	-
	total	55	25	53	22	17	3	377
NW	livestock and cereals	23	23	72	18	22	5	230
	livestock	0	0	-	0	-	0	-
	total	41	23	72	18	22	5	230
S	livestock and cereals	32	31	105	29	14	1	3000
	livestock	1	1	40	1	13	0	-
	total	54	32	103	30	14	1	3000
Total	livestock and cereals	80	78	80	67	17	9	587
	livestock	3	2	31	3	10	0	-
	total	150	80	79	70	17	9	587

1.5 Questionnaire Survey - Farm Management

1.5.1 Profile of 200 Samples

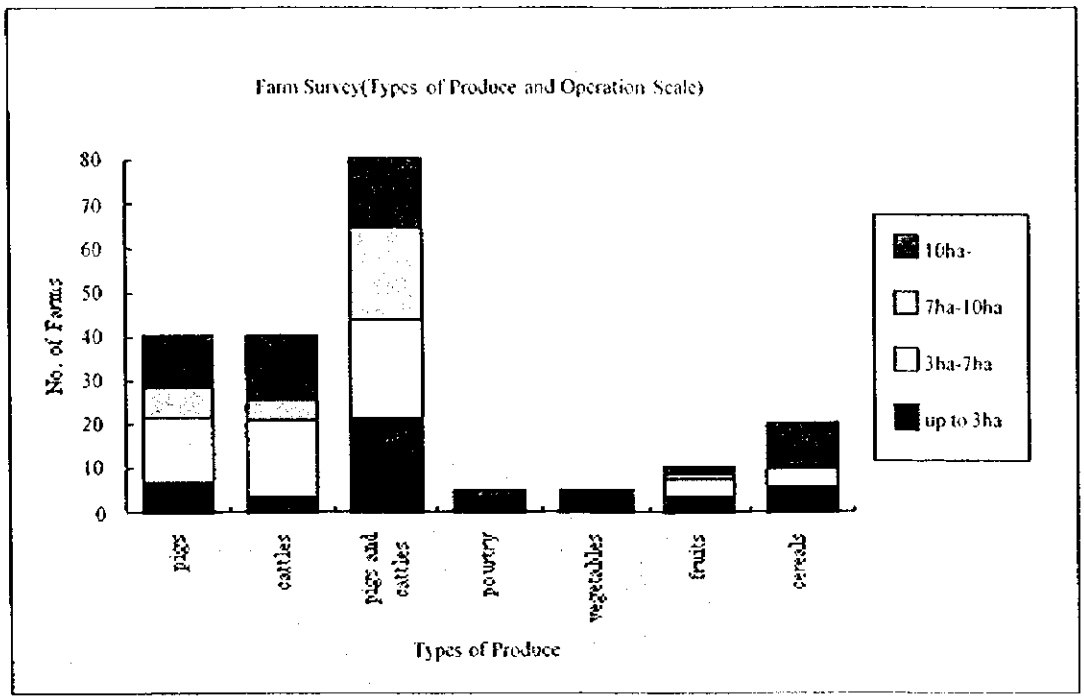
Total numbers of distributed questionnaires were 200, and all of them were collected. Farms were selected by the following criterion.

1) Cover all Gminas
2) Include different sizes of farms
3) Select different types of farms which can reflect the real situation in Konin.

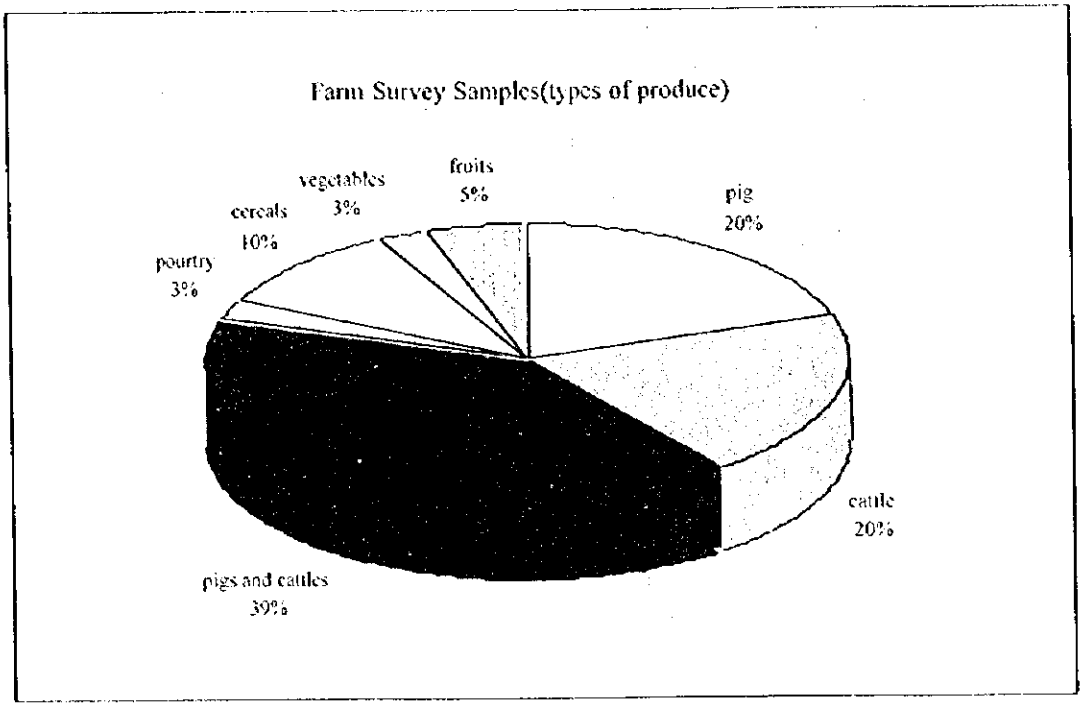
As a result, basically four types of farming operations were selected; namely, cereal and livestock mixed farms, cereals, livestock and vegetables and fruit. Breakdowns of samples are shown in Figure 1.5-1 (1) to (3).

Figure 1.5-1 SAMPLES OVERVIEW

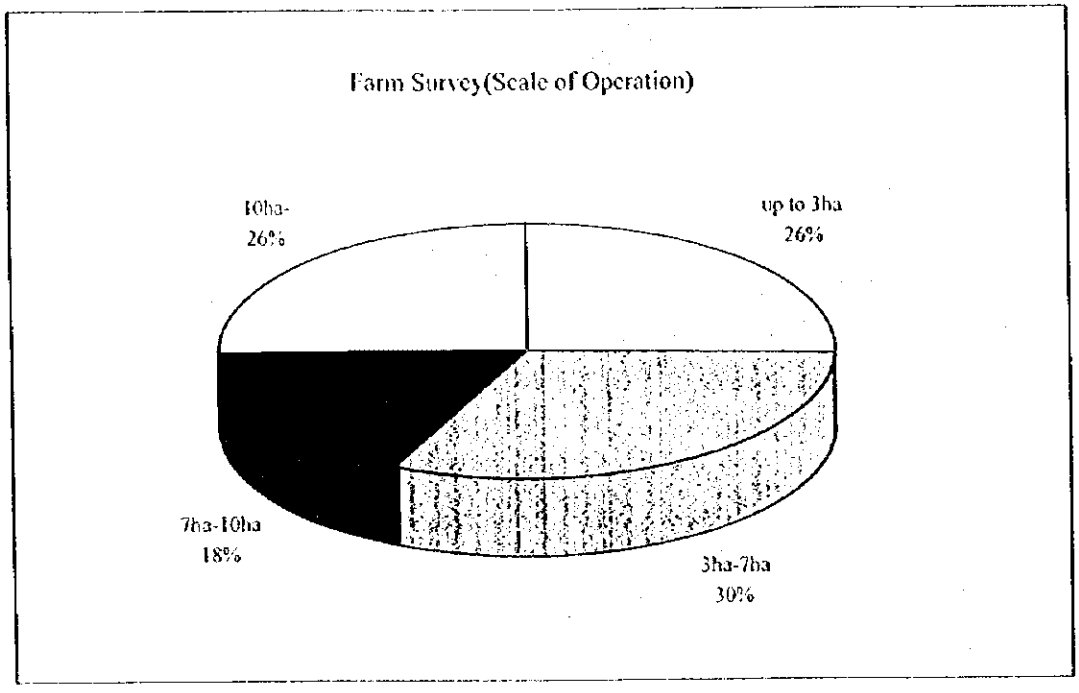
(1) Types of produce and operation scale



(2) Types of produce



(3) Scale of operation



1.5.2 Farm Management Analysis

(1) Types of farming operations

Table 1.5-1 shows profiles of sample farms. Average land size of fruit and vegetable producers is smaller than the others, while average annual working hours are almost twice as many as the others. It implies that labor-intensive farming for vegetables and fruit is not operated on large scale land as are cereals when family members are the main source of the labor force.

Table 1.5-1 also shows small and scattered land plots which are another characteristic of Konin's agriculture sector.

Table 1.5-1 PROFILES OF FARMS

	Number of Farms	Average Land Size(ha)	Average Number of Land Plots	Average Annual Working Hours (mandays)	Average Distance to the Farest Plot (km)
Mixed Farming	84	11.24	3.51	308.23	1.75
Cereal	26	10.41	3.12	281.77	1.74
Livestock	72	10.09	3.97	333.53	2.60
Vegetables & Fruit	16	4.37	2.06	556.09	1.17

(2) Profitability

1) Profitability and types of farming operation

Table 1.5-2 shows average farm income and expenditure structures of 4 types of farming operations. The most profitable farming type is vegetable and fruit farms whose net agriculture profitability is 31.8%, followed by mixed farms. The least profitable farming type is shown to be livestock farms.

Table 1.5-2 AVERAGE INCOME AND EXPENDITURE STRUCTURES OF 4 TYPES OF FARMING

(Unit: PLN)

	Mixed Farm	(%)	Cereals	(%)	Livestock	(%)	Veg & Fruit	(%)
Total Income	33,770	100.0%	32,317	100.0%	51,244	100.0%	43,522	100.0%
Agriculture Income	28,647	84.8%	23,451	72.5%	47,126	92.0%	38,138	87.6%
Nonagriculture Income	5,123	15.2%	8,896	27.5%	4,118	8.0%	5,384	12.4%
Expenditure	20,317	60.2%	18,600	57.5%	42,889	83.7%	24,308	55.9%
Seeds	751	2.2%	1,769	5.5%	564	1.1%	201	0.5%
Fertilizer	1,911	5.7%	2,075	6.4%	1,887	3.7%	968	2.2%
Pesticides	225	0.7%	640	2.0%	209	0.4%	2,714	6.2%
Insecticides	98	0.3%	112	0.3%	285	0.6%	1,019	2.4%
Herbicides	111	1.3%	611	1.9%	362	0.7%	574	1.3%
Machinery	2,276	6.7%	1,250	3.9%	2,837	5.5%	1,519	3.5%
Total fuels	4,666	13.8%	4,062	12.6%	5,110	10.0%	6,581	15.1%
Breeds	726	2.1%	164	0.5%	5,127	10.0%	0	0.0%
Fodder	2,783	8.2%	637	2.0%	17,203	33.6%	0	0.0%
Hired Labour	266	0.8%	919	2.9%	698	1.4%	4,122	9.5%
Services	1,165	3.4%	1,150	3.6%	1,122	2.2%	186	0.4%
Land Lease	117	0.3%	165	0.5%	137	0.3%	0	0.0%
Interest Payments	275	0.8%	595	1.8%	1,265	2.5%	19	0.0%
Water	249	0.7%	242	0.7%	271	0.5%	245	0.6%
Insurance	1,060	3.1%	1,214	3.8%	1,271	2.5%	1,235	2.8%
Others	3,308	9.8%	2,961	9.2%	4,510	8.9%	4,892	11.2%
Net Profit	13,153	39.8%	13,747	12.5%	8,355	16.3%	19,214	11.1%
Net Agriculture Profit*	8,330	24.7%	4,851	15.0%	4,237	8.3%	13,830	31.8%

* Excluding Nonagriculture Income from Total Income

2) Profitability and land size

Figure 1.5-2 (4 figures) shows average agriculture profitability of 4 types of farming operations according to land size. The agriculture profitability is calculated as the ratio of net agriculture income to total agriculture income.

Net Agriculture Income = Total Agriculture Income[1] - Total Agriculture Expenditure

Taking into account that the number of samples is limited in the case of vegetable and fruit farms compared with other types, results should be considered carefully. According to the 4 Figures, there is a trend that the profitability increases as land size is larger to a certain extent. To be more precise, profitability of farms with less than 5 ha is negative regardless of farming type. Therefore, the smaller the land size, the higher the dependency rates on nonagriculture incomes as shown in Table 1.5-3.

[1] Total agriculture income is total sales values of the following: wheat, barley, rye, other cereals, potatoes, ground vegetables, greenhouse vegetables, soft and hard fruit, horses, cows, other cattle, porkers, piglets, sheep, poultry, milk, eggs, wool, agriculture services.

Table 1.5-3 THE SHARE OF NONAGRICULTURE INCOME BY TYPES OF FARMING OPERATIONS (96 SAMPLES [1])

Mixed		Cereals		Livestock		Vegetables & Fruit	
Land Size	Shares of Nonagricul-ture Income	Land Size	Shares of Nonagricul-ture Income	Land Size	Shares of Nonagricul-ture Income	Land Size	Shares of Nonagricul-ture Income
1-5 ha(22)	52.5%	1-5 ha(15)	38.4%	1-5 ha (15)	51.8%	1-3 ha(5)	77.1%
5-10 ha(36)	22.9%	5-10 ha(2)	14.2%	5-10 ha(35)	20.6%	3-5 ha(5)	21.1%
10-15 ha(9)	12.5%	10-20 ha(3)	16.8%	10-15 ha(8)	13.2%	5-7 ha(3)	5.1%
15-30 ha(13)	1.9%	20 ha-(4)	10.5%	15-20 ha(5)	0.7%	7-9 (2)	0.0%
30 ha-(4)	0.0%			20 ha-(9)	4.3%	9ha-(1)	0.0%

Note 1. Concerning the 96 samples collected, nonagriculture income sources are as follows.

a) Mining:	5 farms
b) Aluminum:	1 farm
c) Other Industries (excluding 3 main industries):	6 farms
d) Others:	61 farms
e) Pensions:	24 farms

2. The share of nonagriculture income = nonagriculture income / total income
3. Figures in parentheses are numbers of sample farms.

3) Cost analysis

Table 1.5-2 shows the average cost structure of four types of farming operations. Fuel cost is the largest expenditure for most farming types except for livestock. This is a result of increasing prices of fuels in order to remove price distortions after the change in 1990.

Major costs by types of farming operations are as follows.

Mixed Farms	fodder and fertilizers
Cereal Farms	services (eg. machinery) and fertilizers
Livestock	fodder/feed
Vegetables & Fruit	hired labor

In particular, the profitability of livestock specialized farms is heavily affected by the feed costs. Therefore, some pig breeding farms form an association not only to sell their products at higher prices, but also to purchase feed in a group. In the case of vegetable and fruit farms, which

are typical labor-intensive farming operation, hired labor costs are much higher than those of the other types. Therefore, some farms mentioned that the most important problem is to find a good qualified labor force at affordable salaries. There seems to be a gap between the amount of money farms can pay to workers (in particular, part-time workers during harvesting seasons) and payment requested by workers.

(3) Efficiency

Efficient utilization of assets is of great importance to improve farm profitability. How effectively producers can utilize owned assets in order to generate revenue is one of the important criteria to analyze farm operations. Although exact asset data taking into account depreciation and amortization are not available, rough estimations of total asset data were obtained by the farm surveys. Based upon the 145-sample data collected, Sales to Assets Ratio (SOA) was calculated in order to show "Efficiency " of farm management.

SOA = Total Agriculture Sales / Total Assets

If the ratio is more than 1, the farm utilizes its assets more than 1 time a year in order to generate the year's revenue. If the figure is less than 1, the farm does not utilize all asset values. Normally, efficiency of the livestock sector cannot be analyzed by SOA ratio, as it is not land-intensive production. However, in Konin Province, most livestock producers are more or less engaged in plant production as well in order to feed their animals. In this respect, the livestock sector is also included when calculating SOA ratio.

Figure 1.5-3 shows the average SOA of 145 collected samples according to land size. The result shows that, at present, efficient utilization of farm assets is hardly seen, as average SOA ratio does not even reach 1.

The Figure also indicates that there is a possibility of improving efficiency by enlarging of land size, taking into account that the larger the land size, the greater the SOA ratio.