COMPARISON OF THE POTATO INDUSTRIES IN GREAT BRITAIN AND POLAND,

WITH A STRATEGY FOR THE EXPANSION OF TRADE RELATIONS

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Table 0.1 Comparison of Great Britain and Poland.

	GREAT BRITAIN	POLAND
COUNTRY		
Size (000 km^2)	230	312
Population (mill.)	54	39
GDP (£ 000 mill.)	416	43
GDP/head	7,720	1,112
AGRICULTURE		
Area(mill. ha.)	17.7	18.7
Farms (000)	237	2,682
Average farm size(ha.)	74.5	5
Tractors(000)	> 500	1,100
Tractors/farm	>2.1	0.4
Agriculture as % of GDP	1.5	14.5
Labour force (000)	566	4,800
% of labour force	2.1	29
POTATOES		
Seed demand (000 t)	500	4,600
Certified Seed use (%)	>65	< 10 %
Consumption kg/year	102	160
Average yield (t/ha)	35.8	18.5
Average production (mill. t)	6-7	34-38
Area (000 ha.)	154	1,859
Storage losses (%)	3	30
processing Capacity (000 t)	1,500	160
degree of Mechanisation	high	low

From the information in Table 0.1 it becomes evident that Poland uses a much greater area of land, as well as more labourers and farm units for the production of its potatoes, than Great Britain does. The total yield of potatoes in Poland is 6-7 times larger than in Britain. Therefore in terms of production per labourer, farm unit or hectare, the potato production in Britain is several times higher than in Poland.

The findings of this study did not falsify the hypothesis but consequently brought forward numerous indications, hinting that Britain is capable of providing the goods and services that are badly needed by the Polish potato industry. The import of the British know how, seed and equipment, would therefore accelerate the rate of development in the Polish potato industry. On the Polish side there appear to exist sufficient financial funds, for uplifting the industry, provided by organisations as the World Bank, EEC and UK-government.

Poland will eventually obtain the agricultural goods and services from one country or another. The agricultural/potato industry of Great Britain can choose whether or not is wants to participate in this economic activity. The British strategy of exploiting the opportunities in Poland, should include the following steps, namely holistic approach, focus of attention, physical presence, binding of stakeholders,use of international funds, exchange of information and piggybacking.

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1. INTRODUCTION

1.1 INTERNATIONAL BUSINESS AND TRADE

International trade and the growth of the national and global economy are closely intertwined. International trade and the World economy are mutually supportive, whereby a growth in the economy will result in a growth of the world wide trade volume, and vice versa.

Many disciplines have studied international business and trade from different perspectives e.g. economical, social, technical, anthropological and marketing. Apart from the outdated mercantilistic view, all theories and scholars seem to have reached an agreement that, international trade is beneficial to both individuals and countries as a whole.

International trade proves to be a vital component of the economies of all countries. Trade leads to structural shifts in the economic organisation of countries, and this provides new opportunities for firms,workers and consumers.(Rugman et.al,1985).Trade and marketing also improve the standards of living, create economic value, reduce prices and improve the industrial and commercial bases of an economy (Kaynak,E,1986).

Participants in international trade relations tend to increase their individual wealth on an overall bases. The clear evidence for this conclusion is provided by many centuries of world trade whereby trade itself improved the economic conditions of those involved in it. If trade should have a negative influence upon the individual wealth of the people involved, it simply would have ceased to exist centuries ago.

On another level of involvement, trade introduces new technologies, techniques and products. International trade also enhances a more efficient allocation of scarce resources like money, raw materials, energy, land and management skills. Furthermore trade allows countries to use their absolute and relative advantages in the production of goods and services.

International trade of agricultural commodities, as well as the trade of agricultural means of production are very important for both industrialized and industrializing countries. Between 1973 and 1986 the value of the world trade in agricultural products alone increased from US $ 101 billion to $ 230 billion. (de Hoog and Silvis,1990). EEC-imports of agricultural products alone account for some 25% of the total. Whereas the EEC-exports on agricultural products only account for some 9-12 % of the world wide trade in agricultural products.

The potential advantage of highly industrialized countries in participating in the trade of agricultural products, lies in the purchase of a cheaper food basket then production of all necessary goods locally. As for the less industrialized countries, the advantage lies in gaining of hard currency, as well as a more optimal use of the local and cheap available means of production. Increases in agricultural output per capita inevitably liberalize time,money and people who can then contribute to other parts of the national economy.

The political changes in Central and Eastern Europe, and especially the new policies towards economies which are market oriented, will have a great influence upon the trade of agricultural products and supporting equipment. Viewed from the Western European and North American side, this transition to a market economy is welcomed. One may agree that support should be given to the countries in the process of transition, but opinions differ upon the most suitable way.

There appear to be two main streams of thought; One that sees free (or less restricted) trade as a mean for these countries to increase their economic strength. The other stream is in favour of increasing the purchasing power more rapidly, by transferring large sums of money. This for instance took place in the case of Eastern-Germany,but not without a bitter aftermath. This approach is unlikely to be used for other countries, due to budget problems in the West and the culturally much loser connection between the donor and receiving countries.

More support is available for the EEC/World Bank vision that improvement of the living conditions in the East should be established through increased production and trade. A combination of lower trade barriers to export from the east to the west, in conjunction with selective financial support for increasing the domestic production, should be the most appropriate way for development; For it leaves the East European countries free to develop in their own individual way. Furthermore it could lead to a structural increase of purchasing power from Eastern consumers for high technology products from the West.

International trade of agricultural products and related goods is a very important aspect for the economic growth of the countries involved, and the world economy as a whole.

1.2 THE POTATO INDUSTRY

Potatoes are being produced in 130 countries, and are becoming increasingly important to many developing countries. (Hourton,1987). Potatoes are a staple food in Western and Eastern Europe, North America and a in considerable number of developing countries. Favourable characteristics of the potato are the high production of edible energy and proteins per hectare as well as per day. (van der Zaag,1983). Production of potatoes is most significant, currently accounting for almost half the output in root crops (FAO,1993). Finally, potatoes can be stored and transported more easily than many other vegetables. These facts make the potato crop and its related industry of significant importance in the agricultural scene and agricultural trade in the East and West of Europe.

YIELD AND AREA

The world area on which potatoes were grown in 1991 was estimated to be 17,710,000 hectares. The average yield was 14.746 kg/hectare, which brings the total production of 1991 to 261,162,000 t. Over the year 1991 the area and production of potatoes in the various production regions presented the following picture.

Table 1.1 Potato production world wide 1991.

Region/country	(000 ha)	(000 kg)	t/ha
World	17,710	261,162	14.7
Europe	4,199	85,054	20.255
EEC	1,324	42,731	32.27
UK	162	6,700	41.358
Poland	1,733	29,038	16.759
CIS	6,000	64,500	10.750
Africa	725	6,814	9.403
NC-America	773	23,135	29.911
S-America	875	11,081	12.658
Asia	5,088	69,111	13.582
Oceania	49	1,467	29.844

Source: FAO Yearbook of Production.

The differences in yields can be explained by two causal factors;

1 Differences in biological and geographical conditions under which the crop is growing (e.g.soil type,diseases, climate and day length).

2 Differences in the treatment the crop receives through the actions of man (e,g. fertilisation, measures against diseases, breeding, machinery and the socio-economic infrastructure).

CULTIVATION

Potatoes are usually grown by planting of seed potatoes in a quantity of 2.5-3 t/ha. The seed potatoes are planted in rows, preferably in clod-free and disease

free soil. In Northern Europe seed potatoes are planted during spring time, and the ware potatoes are harvested around September. The growing season can vary widely due to the climatic conditions of the place of cultivation and the intended end use of the crop (seed/ ware/ processing).

Technically it is also possible to grow ware potatoes from mini-micro and true seed. The commercial applications of these methods however are not yet developed to a satisfactory level. Mini- and micro-tubers do have commercial applications in the growing of high grade seed.

Potatoes can be planted, maintained and harvested by hand. On the Western-European farms this whole process is largely carried out with the use of modern machinery and equipment. Farm size and labour cost make it impossible to manage without them.

As fresh potatoes only come available during the summer period (in Western Europe), potatoes have to be stored over the winter. Adequate storage is of great importance to the financial well being of the growers. With the use of proper storage facilities the losses can be as low as 2-3 % of the total crop. When proper storage is not available, the losses can easily mount up to 50 % or more.

USAGE

The harvested potato tubers can be used for five different products;

1 seed potatoes; The yield of a previous year is used partly or completely as seed to grow another generation. In developed countries the growing of seed potatoes is a specialization that gets rewarded with a price premium compared to the ware potatoes. In order to produce high quality (high grade) seed, the producer will have to start from seed which has an even higher quality and price.

2 ware potatoes; These potatoes are consumed by humans after being cooked or baked. As consumers have a preference for fresh (i.e. recently harvested) potatoes, there is a price premium for ware potatoes that are sold out of season. There are two ways to obtain this price premium. First of all one can grow the potatoes on other parts of Europe (Cyprus, Mediterranean) and transport the fresh ware potatoes to Northern European Markets. Secondly one can store the potatoes over Winter, and sell them in the Winter/early Spring.

3 processed potato products; Processed potatoes are all the products made from potatoes, which still have a final consumption by humans. Best known products in this category are chips,crisps and other snacks. However there is a wide range of other appliances such as mashed potatoes,dehydrated potatoes,and chilled potatoes.

4 starch; Just under 20% of the potato tuber consists of starch. This starch can be extracted from the potatoes and then be used for more than 200 different applications in industry,textile, food, glues etc. Approximately 10% of the worldwide volume of starch production (25 million ton in 1990) stems from potato starch.

5 animal feed; Potatoes have a high nutritive value and are also used to feed livestock. Within Western Europe this only happens in rare situations.

Although the five products seem quite interchangeable at first sight, they are not in the Western part of Europe or North America. Potatoes tend to be bred and grown for one of the five specific end uses. Starch potatoes with an extra high content are not appreciated by consumers. Ware potatoes, in Western Europe and North America, can capture a price premium for the visual appearance and shelf life; While seed potatoes demand a different smaller size than potatoes destined for the processing industry. If there is a specialized demand for some or all of these five products, the farmer acts in his best interest by specializing as well on the production of one or two of the potato products.

There are numerous ways to consume potatoes e.g. the whole tuber after boiling, as fried potatoes as flakes or as ingredients for other foods. The potato also

possess good qualities as animal food. Furthermore starch can be extracted from potatoes, which makes them a valuable raw material for the starch industry.

INTERNATIONAL TRADE

Assessing the world volume and value of the international trade in potatoes and related goods is very difficult. The FAO-annual yearbook of trade publishes the value and volume, individual countries have traded on a yearly basis. These figures however are a compilation of seed, ware and processed potatoes, whereby the separate products can not be identified. Furthermore there are indications that the figures documented on potato trade are far, (sometimes more than 300%) below the actual figures (Renia,1992).

The FAO estimated the value of worldwide trade in potatoes for 1990 to lie at $ 2,028 million. Even when the low-estimates of FAO are used, the potato trade accounts for almost 1% of the total value of agricultural trade. Most of the trade in potatoes takes place within the European continent (approximately 78% in 1990).

Accurate figures about the trade in potato related equipment are even harder to obtain, as the equipment for the harvesting, handling and storage of potatoes is mostly part of the general machinery statistics. The large companies who are involved in the trade of potato related machinery, see little profit in opening

their statistics for the public or the scientist.

Intensive trade relations do exist for instance Scotland exports seed potatoes to more than 40 countries in the world. Due to the single market in Europe, and the expected rise in purchasing power of East European farmers, an increase of the trade volume is more likely than a decrease.

KEY ELEMENTS OF THE INDUSTRY

The core of the potato industry comprises the following elements: seed potatoes, ware potatoes, processed products, machinery, and storage. The presence of each of these elements is necessary for the production of high quality food for a customer that becomes increasingly more demanding.

The seed that a farmer uses determines the variety and therefore the taste and characteristics of the potato that will be eventually harvested. The quality and variety of the seed determine the susceptibility of the crop to diseases, drought and insects. Choice of the seed should be in accordance with the advantages and disadvantages of the soil, as well as with the expected demand of the final product. Planting of starch varieties eliminates the potential end use of human consumption. The planting of many tasty table potatoes reduces the possible end use for the processing industry. Access to seed potatoes of high quality, which brings forth potatoes that are marketable, is vital to the potato industry.

Ware potatoes are the most basic product of the industry, they are the ones that determine the overall profitability of the industry. Ware potatoes need to meet customers demands for a fresh product with pleasant visible characteristics. Customers are willing to pay a lot of extra money for early potatoes from Cyprus for example which arrive at the domestic markets outside the normal growing season. Furthermore customers display a wide variety of demands in respect of the taste, colour and cooking qualities of the potato. Unless there is a demand for its potatoes, the industry has no reason of existence.

The processing aspect may be reasonably new to the potato industry, but it proves to be a force that changes the face of the potato industry completely. McDonnalds for instance has

promised its customers to provide the same quality of french fries world wide. This consequently means that its purchasing of potatoes is restricted to one or at most two varieties of potatoes. The characteristics that exert influence over the processing qualities of potatoes are nearly infinite; colour, sugar reducing content, fat absorbtion, shelf life and even 'bite'-character. In most developed countries, processed potatoes account for one third of the total potato consumption. A potato industry lacking a strong processing component might have been viable before the second world war, but can prove to be anachronistic in 1993.

Machinery is of major importance to the potato industry, as it determines the quantities that can be grown per farmer, as well as the quality of the final product. Appropriate use of machinery can prevent unnecessary damage to the final crop and bring forth higher yields.

The importance of storage becomes evident from the fact that the potato is a perishable crop, that can be preserved several months, only with a significant amount of extra care. The need for storage can be minimum in countries around the equator,like Nicaragua where potatoes can be harvested throughout the year and excessive demand exists as well. In the more moderate climates potatoes can only be harvested once a year, while the demand exists throughout the whole year. Therefore adequate storage capacity can make or break the potato industry in Europe. As one can see in chapter 3, the potato processing season in Poland is limited to 3 months as there is not enough storage capacity in the remaining nine months.

1.3 HYPOTHESES AND RESEARCH AIM

RESEARCH

The research was carried out in part full-filament of the one year MBA-course at the University of Stirling, Scotland. This project represented the final part of the International Business Variant, within the MBA. Supervision was provided by Dr.W.Curry, senior lecturer in International Business at the University. The project has been funded completely by CAROS international and Scottish Enterprise Tayside (SET), as part of anexchange that was set up by the Scottish International Resource Project (SIRP).

The project evolved out of several discussions between CAROS and SET over the development of potential market opportunities in Central and Eastern Europe. CAROS is a consortium of the following Scottish Research Organisations; Macaulay Land Use Research Institute, Moredun Research Institute, Rowett Research Institute, Scottish Crop Research Institute, Scottish Agricultural College, Scottish Agricultural Statistics Service and the Hannah Research Institute. CAROS is actively involved in the transfer of agricultural knowledge from Scotland to countries oversees. Tayside Regional Council is an active promoter of the export potential that is available with in the Tayside region.

The research was carried out on a full-time basis during the months of June, July and August of 1993, using the CAROS headquarters as home-basis.

HYPOTHESES

Preliminary scanning of the literature and discussion with specialists from CAROS and SCRI, concluded in the formulation of the following hypotheses:

"Within the scope of the potato Industry, the establishment of intensive trade relations between Poland and Great Britain, including the transfer of technology, machinery and seed potatoes,will bring economic benefits to both countries."

Falsification of this hypotheses will prevent the potato industry of both countries from allocating their resources towards a goal that will bring no reward. Verification of this hypotheses will justify the initial investment of human capital,time and money necessary to initiate this bilateral trade, as it should be able to become profitable itself within a few years.

RESEARCH AIM

This research aims to provide stake holders in the potato industry of both countries with reliable and accurate information, which will facilitate their process of decision making. Furthermore it offers key-elements for a strategy to

develop the potential that has been identified. Both elements, the provision of information and elements for a successful strategy, will make a contribution towards the social and economic integration of East and Western Europe.

1.4 METHODOLOGY

The work for this dissertation consists of four parts which are largely intertwined. First of all a literature research for which the libraries at SCRI, SAC/University of Edinburgh, Wageningen Agricultural University, University of Stirling and the University of Dundee were visited. On Link searches were conducted at the Cambridge library employing the Janet system, as well as CD-rom searches at the abstracts of the Commonwealth Agricultural Bureau.

The second part comprised of a several semi-structured interviews with authorities from the UK potato Industry, in order to assess the present situation in Great Britain.

In the third part an assessment of the present situation in Poland was carried out, through the use of semi-structured questionnaires that were send to 6 authorities of the Polish potato Industry. Parallel to the written questions to

people in Poland, there have been a number of discussions with a scientist from Jadwisin (Poland), the leader of the Post-harvest program of the International Potato Centre (CIP) and British experts who had visited Poland in the past 24 months.

The forth part, and the most important for the testing of the hypotheses, consisted of a number of in depth discussion with potato specialists in an attempt to assess the form and content of future trade relations.

As mentioned before, the four components of the project were strongly intertwined. Most of the people interviewed in Scotland have published about the potato industry, have visited Poland at least once, and also have explicit views about the future of Scottish exports. Therefore information was often received simultaneously as opposed to sequentially.

1.5 CHAPTER OUTLINE

The thesis concists of five chapters, starting with an introduction on international trade, the potato industry in general and the hypotheses and research aim of the study. The introductionary chapter is followed by two country specific chapters.

Each describing the potato industry and its environmental setting of Great Britain and Poland respectively.

The two chapters are logically follwed by the forth chapter in which the industries of these two countries are compared, and the conclusion about the hypostheses is made.

Finally the fifth chapter takes the positive conclusion of the previous chapter as a basis to discuss the key elements to further develop the trade relations between Great Britain and Poland.

2 THE BRITISH POTATO INDUSTRY

2.1 AGRICULTURE IN BRITAIN

Great Britain consists of the countries Scotland, England and Wales. The overall population of Great Britain is estimated to be 54 million; 49 million in England and Wales and 5 million in Scotland. Great Britain has an area of 230,000 km2. Being part of the United Kingdom, it holds a long tradition in favour of democracy and free-market mechanisms. Since 1973 the UK is a member of the European Community.The United Kingdom is headed by a monarch, Queen Elizabeth, but politically led by a Prime Minister.

Great Britain can be among listed the richest countries in the world, and it holds a considerable political clout in organisations such as the United Nations Security Council and the G7.

Northern Ireland is part of the United Kingdom, but not of Great Britain. As Northern Ireland has a separate Potato marketing Scheme, it has not been taken into account for this study.

ECONOMY

The GDP for the UK in 1990 measured £416,888 million. The main contributors to the GDP are Manufacturing (22.4%), Banking and Finance (18.3%), as well as distribution, hotels and repairs (14.7%) and Education and health services (9.5%). Agriculture only accounted for 1.5 % of the 1990 GDP. Over the year 1990 the UK had a trade deficit of £ 16 million. The UK has a work force of 28,510 million, of whom 3 million (5.8%) are presently unemployed.

British agriculture is highly efficient and productive. In 1990 only 2.1 % (566,000) of the population was employed in agriculture, yet Britain as a whole was 56 % self-sufficient in its overall food demand. Agriculture contributed around £ 6,378 million towards the GDP, which is only 1.5 %. Britain is a major exporter of agricultural produce and food products, agrochemicals and agricultural machinery.(HMSO,1992)

Agriculture utilizes some 77 % of the available land, which comes down to 12 million hectares for crops and grass and almost 6 million hectares for grazing. Britain has approximately 237,400 farms. The average farm size is 100.7 hectares. Between 1979 and 1990 agricultural labour productivity has risen at more than 70% (HMSO,1992).

More than half of the farms are dairy farms. By 1990 Britain had a total of 12 million cows and calves, 43 million sheep and lambs, 7 billion pigs and 124 billion poultry. The average yield of milk per cow per annum lies at 5,137 litres. Milking is almost always done mechanically. The main crops for the United Kingdom in 1990 are as follows;

Table 2.1 UK crops 1992.

Production	area (000)	(000)	yield t/ha.
Wheat	2,013	14,035	6.97
Barley	1,517	7,894	5.2
Oats	107	7,894	4.94
Potatoes	178	6,390	35.84
Oilseed	390	1,209	3.10
Sugar Beet	194	8,000	41.24

Source: HMSO,1992

POTATOES

The potato crop is of considerable importance to Great Britain, for following reasons. First of all potato consumption in Great Britain (102 kg/head/year) is the second highest of all EEC-countries. Only the Irish consume more potatoes than the British. The retail value of potatoes and potato products in Britain has been calculated to be £ 2.5 billion (PMB,1992). Secondly the national production of more than 6 million tons per year makes Britain the worlds ninth

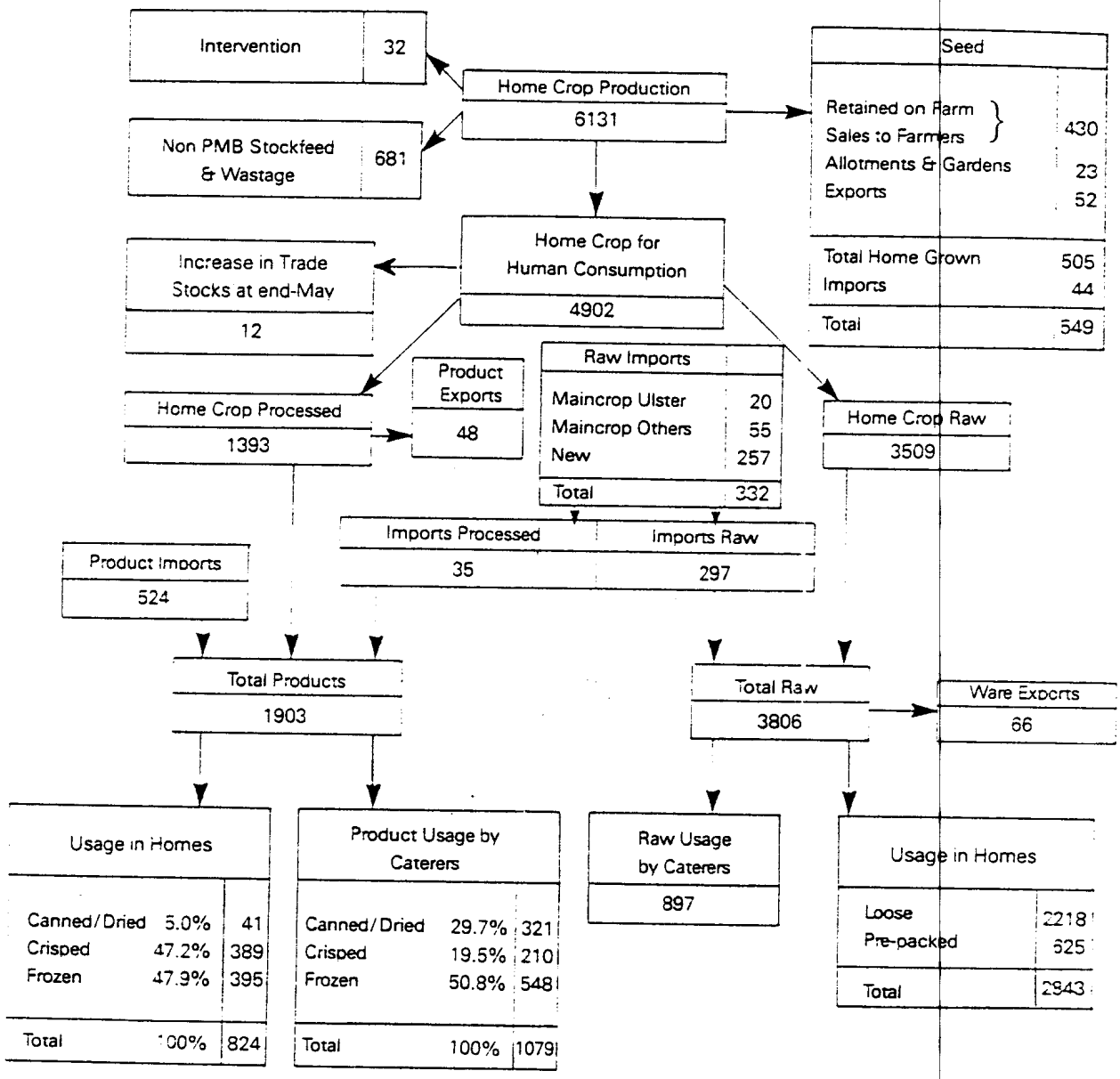
largest potato producer (Young,1990). Potatoes account for some 5 % of the British farm income. A flow chart of for potatoes in Great Britain is given on page 24.

In 1990 an area of 154,060 hectares was used for the production of potatoes. Of this area 83 % was located in England and Wales, with the remaining 17 % in Scotland. Where the production of certified seed is concerned, the situation is reversed. Some 90 % of all seed grown in Britain originates from Scotland. Potatoes were cultivated on 17,141 farms in 1991.

A unique element of the British potato industry is the Potato Marketing Scheme (PMS) which is administered by the Potato Marketing Board (PMB). Potato production in Britain has been under the PMS since 1933. The PMS aims to make the supply and the demand of potatoes meet within Great Britain. The reason for this scheme lies in the importance of the crop and the limited market power that farmers can exercise.

The PMS is managed by the Potato Marketing Board. The PMB in turn sets an annual quota for the acreage of potatoes that may be grown without paying a fine. The growing of potatoes in excess of the area allocated to an individual farmer brings about a fine which is mostly as high as the value of the crop.

FLOW CHART FOR POTATOES IN GREAT BRITAIN: JUNE, 1990 – MAY, 1991



Figures other than percentages are in '000 tonnes raw potatoes.
Processed potato products are quoted as raw potato equivalents.
Since the individual estimates within the above data are subject to errors varying in degree, those given for a particular season should be treated with reserve.
Comparisons made over a number of seasons will indicate trends in the patterns of consumption.

Sources: PMB and MAFF

The PMS is not free from controversy, as potato processors argue that it increases the price of potatoes unnecessarily. Secondly the PMS has not been able to prevent substantial amounts of ware potatoes being imported, as domestic supply can not meet domestic demand. Thirdly there are suggestions from the European commission about the establishment of a uniform potato marketing scheme in Europe. Such a legislation could entail a great change for the British marketing scheme. However,it has been agreed that the present PMS will remain intact untill 1994.

2.2 SEED POTATOES

PRODUCTION

The area used for seed production lies between 16 and 17-thousand hectares, whereby most of the area is located in Scotland and the North of England. For 1991 the area planted for seed potatoes was 16,074 hectares, of which 14,205 hectares (88 %) was located in Scotland (PMB). Scotland is in an ideal situation to produce high quality, high grade seed, as its has both the natural circumstances and human resources that are needed for production. The average yield for seed potatoes lies around 22 t/ ha, and approximately 66 % of the potato plantings use certified seed. (Young,1990).

Great Britain imports some 30-40,000 tonnes of seed per year, mainly from Holland and Ireland. On the other hand Great Britain export almost the same amount to a wide variety of countries such as Cyprus, Algeria and the Ukraine.

VARIETIES

Great Britain has excellent capacities for the breeding of new varieties, adapted to the latest requirements of consumers and the processing industry. Breeding activities are undertaken by State funded institutes, of which the SCRI is the most important one, as well as by some large private companies. At the moment more than 40 % of the potato area is planted with British varieties, while the remainder is planted with Dutch and Irish varieties.

The share of the most important varieties to the totally planted area is following; Maris Piper (14 %), Desiree (11 %), Record (11%),Penthal Crown (5%), Pentland Dell (6%) and Pentland Squire (7%) (Young,1990).

PRODUCERS

All of the more than 17,000 growers who are registered with the PMB, are allowed to grow seed potatoes. However in order to grow classified seed, which has a higher quality and price, the growers has to meet certain criteria. The seed

with which the growers start has to be classified and of a very high quality. During the growing season the prospective seed is inspected several times.

Although there were almost 400 licensed merchants for seed potatoes, around half of the total production is sold through the following companies; Nickersons Seeds, SE-growers, Grampian growers, Dalgety Produce, McCain, PBI, UB, Anglian Produce. This concentration of seed sales is still relative small compared with the Dutch situation whereby individual companies have market shares of up to 40 % of the seed market (Renia,1992)

2.3 WARE POTATOES

Great Britain has got some 1500 licensed ware potato merchants, who connect the grower with the consumer. By 1981 there were 67 merchants who had an annual throughput of 10,000 tonnes or more,and these merchants together handled 42 % of the ware market (Ritson,1985). The individual growers however are totally free to sell their potatoes directly to the customers, which happens on a large scale. According to the PMB, more than 10% of all the ware potato purchases by final consumers are made directly at the grower.

Estimates hold it that some 15 % of all potatoes are sold through supermarkets.

The influence of the supermarket on the producers behaviour however is much larger. Most farmers aim to sell their produce to supermarkets, and they go through a lot of effort to meet the additional quality and grading demand. Effectively only a small percentage of the crop is bought by supermarkets.

CUSTOMERS

The British consumer has access to a wide variety of freshly available vegetables. This makes him very demanding towards the physical and visual appearance of the ware potatoes that are being offered to him. British consumers will try to obtain fresh potatoes wherever possible, which lead the producers to come up with three sales seasons.

In Britain there are separate sales seasons and potato varieties for first earlies (or new), second earlies and maincrop potatoes. Farmers have to target their production and variety choice to one of these three sales seasons. Outwit these sales seasons, the potatoes that are being sold have either a stored or a foreign origin.

The main varieties for each season are following;

First earlies: Maris Bard, Pentland Javelin, Ulster Sceptre, Arran Comet and Epicure.

Second earlies: Wilja and Estima

Maincrop: Maris Piper, Desiree,Pentland Crown, Pentland Squire, Pentland Dell, King Edward, and Romano.

2.4 PROCESSED POTATOES

The potato processing industry is one of the most important components of the British potato industry. Around one third of the national yield is being processed, while the processing industry has to buy additional raw material from abroad. Besides the import of ware potatoes for processing, Britain is a net importer of processed potato products.

The annual capacity of the British processing industry was just over 1,600,000 t. of fresh potatoes in 1990, and an increase is expected. From all potatoes, 48 % is processed into crisps while 42 % is processed into chips. It is important to note that although the crisp products only account for 27 % of the produced volume, they account for 75 % of the produced value. The remaining potato products are the dehydrated and canned potatoes.

For means of illustration, the breakdown of 1988/1989 production is presented;

Table 2.2 Processed Potato Production

product	production (in raw potato equivalent)
Canned potatoes	207,000 t
Dehydrated	13,000 t
Crisped	654,000 t
Chips	715,000 t

Source:PMB.

Only a few companies are involved in the processing industry. In the production of chips, McCain is the absolute market leader, with 60 % of the countries chips processing capacity. It will be evident that McCain can exercise serious buying power where the quality of the raw potatoes is concerned. McCain U.K. however is just one of the branches of McCain Foods Ltd. from Canada. This multinational giant, with a turnover of more than £ 1 billion in 1988,has got 48 factories in 8 countries outside Canada. At present half of this turnover is being realized in Europe.

In the Crisp industry the market leader is Pepsico Food International, followed by UB Foods and Dalgety Foods. The capacity of Pepsico, which produces under the names of Walker Crisps and Smiths, is estimated at 150,000-200,000 t (Ennew, 1993). UB Foods manufactures under the name of KP while Dalgety produces under the name of Golden Wonder.

The value of the processed potato market in Britain was estimated to be £ 610 million for 1992 , whereby imports accounted for £ 193 million.(Ennew,1993).

2.5 MECHANISATION

Potato growing is highly mechanised in Great Britain. Since the second world war horses have become rare for farm work purposes. Over the past decades machinery for potato cultivation has become cheaper in relation to the rising costs of human labour. Due to the use of machinery, the farming population has been able to increase the agricultural output, with the use of less people. Nowadays only 17,000 farmers are involved with the growing of the national potato yield,

An average, not markedly modernized, potato grower in Britain will use the following machinery for cultivation;

Tractor and plough, to plough the field at approximately 30 cm. Cultivators which operate on the power-take-of the tractors to prepare the field before planting. The main types are the vertical axis rotary cultivator, the reciprocating harrow and the horizontal axis spiked rotary cultivator (Harris,1992). Where

necessary stone and cloth windrowing machines are used to reduce damage of the tubers at the time of harvesting. British farmers also have access to a wide variety of potato planting machines, as well as fertilizing equipment.

Before the harvesting operation begins, the farmers get rid of the potato haulms either by burning, halm pulling or lifting and reburying, which is all mechanized. In the process of harvesting the following activities are carried out mechanically; digging of the ridge or bed, sieving and conveying the potatoes and soil, separating haulms and roots, further cleaning of the potato and transport of the potatoes to either boxes or a bunker on the harvester. The four most important types for potato harvesting are single row manned, two-row manned, two-row unmanned, and four row self propelled.

After the harvesting process, either before or after storage, the potatoes are graded. This means that the crop is rearranged into two or three cathegories of tubers of similar size. Grading is of great importance to meet the customers demand. The processing industry prefers large potatoes of about 50 mm or more, whereas seed potatoes need to be of small size. Graded potatoes have a price premium, as it facilitates the end use by different types of customers.

Throughout all of Britain there exists an extensive network of machinery dealers

and mechanicians. The farmers can chose from a wide variety of brands and types, which can be delivered within weeks after purchasing. In the case of failures, spare parts and trained mechanics are readily available.

Some farmers share machinery in so called machine circles, but the majority of the farmers buy and purchase their own equipment.

2.6 STORAGE

LOSSES

As the demand for potatoes is rather constant during the year, and the potato tubers are harvested only once a year, storage of the yield is of vital importance. Producers who are able to store their yield for some months, and sell at a later stage ,will receive a price premium. There are three main causes for losses of the original yielded quantity of potatoes.

First of all the tuber still remains a living organism after harvesting. In order to continue with the life processes the tuber requires energy which in turn it subtracts from its own reservoir. This, together with the evaporation processes leads inevitably to losses in the weight of the tuber.

Besides the loss in quantity, the life processes can also cause a loss in the quality of the potatoes, as the chemical composition itself may be affected.

Secondly potatoes are perishable products; fungi, bacteria and animals are all serious threats to the preservation of the yielded crop. Finally potatoes get lost or damaged during the transport from the fields to the final consumers. Damages during the transportation make the potatoes highly vulnerable to fungi and bacterial losses.

The abilities for storage of potatoes however is already determined before the beginning of the actual storage, by such factors as potato variety, growing techniques, type of soil, weather conditions during growth, diseases before harvesting and maturity of potatoes (Rastovski).

The storability of potatoes therefore depends upon three features; the potato, the storage conditions and the storage duration. Even the best storage facilities however can only slow down the process of change. On the other hand inappropriate storage facilities can relinquish every crop irrespective of its own characteristics. When the potatoes are kept well protected from animals, the main causes for losses are respiration, sprouting, chemical changes, spread of diseases, damage by extreme temperatures and evaporation of water from tubers.

MODERN STORAGE

There are two main systems of storing potatoes, bulk storage and box storage. For bulk storage the potatoes are brought together in one building, and stored up to a height of 4-5 meters. For box storage the potatoes are stored in boxes of 1.7 to 2.2 m3, and the boxes are than placed in a storage building. Both alternative ways of storage employ a wide range of technical equipment to control the temperature and humidity in the building.

Bulk storage is cheaper than box storage, but difference in temperature occur between the upper and lower parts of the stored potatoes. Box storage is more expensive, but allows identification of different varieties or owners, and has one round of handling (and damaging) less than bulk storage does (Bishop,1980).

Due to the use of modern equipment, the storage losses are around 3 % of the total production. Losses due to animals are rare, and most of the damages caused by fungi and bacteria can be eliminated as well. The loss of 3 % approximates the lowest technical achievable loss. A loss of 0% is impossible because of to the biological processes that continue to take place in the potato.

3 THE POLISH POTATO INDUSTRY

3.1 COUNTRY PROFILE

INTRODUCTION

Poland is in the middle of the transformation process from a centrally planned economy under communist rule, into a market-led economy within a democracy. These two major elements of change complicate an accurate description of both the present and immediate future situation. "The rules of the game are in a constant flux, because those who are in power are too weak to protect the old pattern,and those who are pushing to open the closed system are too weak to impose the new"(Lamentowics,1990).

Landslide changes both in the fields of economy and politics can easily outdate even the most recent surveys and statistics. Apart from the geographical data, the socio-economic information in this paragraph should be taken to be indicative and relative.

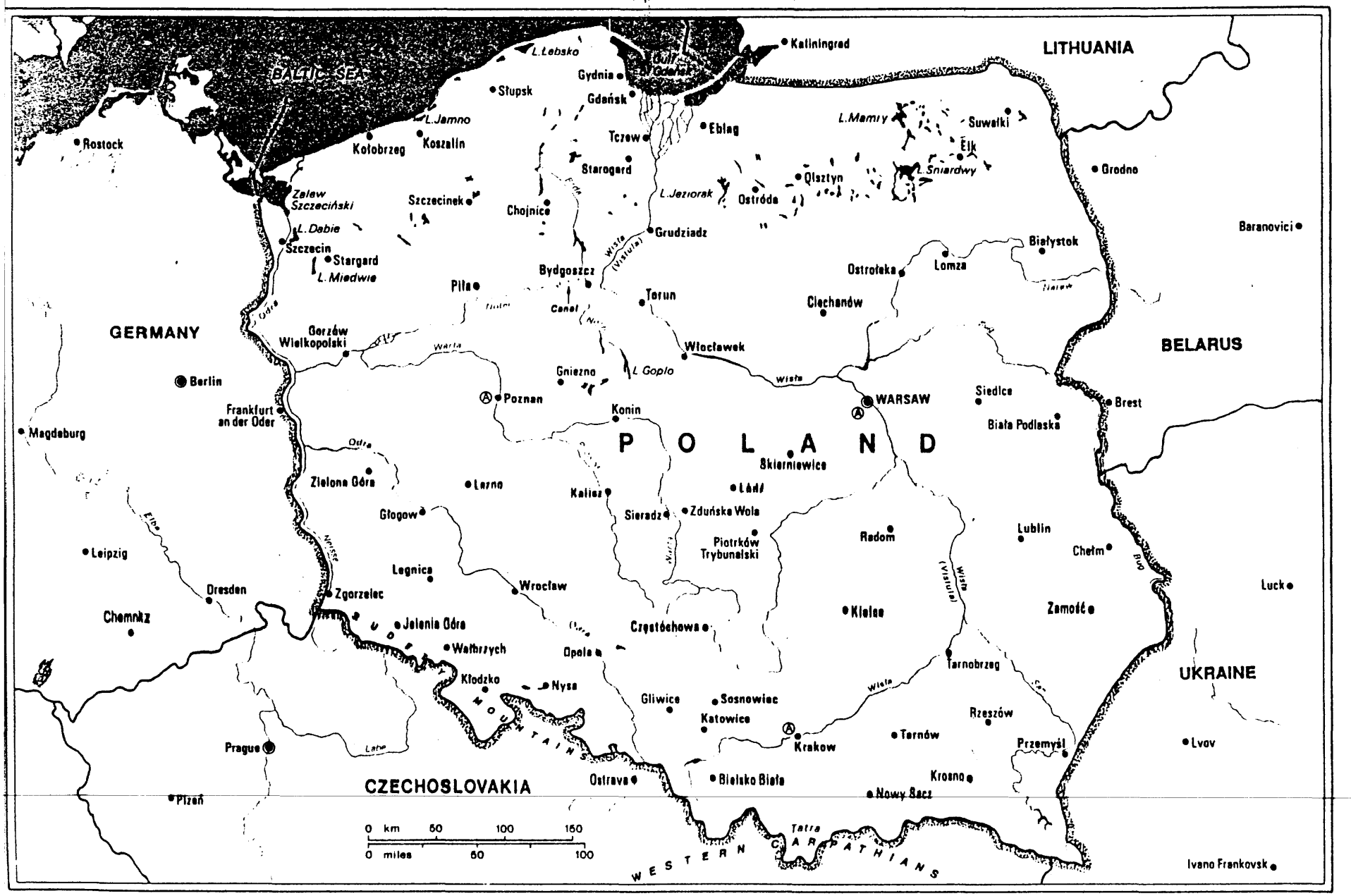
GEOGRAPHY

Poland is located between Russia, Lithuania,Byelorussia and the Ukraine in the east,the republics of Czech and Slovak in the South, Germany in the west and the Baltic sea in the north.

With 312,683 square kilometres, Poland is approximatly 1.3 times bigger than the UK, and 4 times bigger than Scotland. Almost the whole country consists of a vast plain with only few highlands in the south-east and south-west. More than 90 percent of the country lies below 300 meters, which is beneficial for agriculture. 60.4 % of the land is used for agriculture, 28.3 % for forestry, and 2.6 % in lakes and rivers. The remaining land is occupied by cities and roads.

The climate in Poland is continental, with considerable snow and fog during the winter. The annual rainfall lies between 500- and 650 millimetres.

The railway network consists of 24,356 km, of which 7,091 km is electrified.The network is almost entirely single track. some 25% of the locomotives still run on steam engines. Large ports exist in Gdansk, Gdynia and Szczecin. The total road network measures 254,100 kilometres, of which 120,000 km. is paved (1981).


BALTIC SEA
L.Lebsko
Gulf of Gdańsk
Kaliningrad
LITHUANIA
Gdynia
Słupsk
Gdańsk
L.Jamno
Rostock
Kołobrzeg
Koszalin
Tczew
Elbląg
L.Mamry
Suwałki
Ełk
Zalew Szczeciński
Szczecinek
Chojnice
Starogard
L.Jeziorak
Ostróda
Olsztyn
L.Śniardwy
Grodno
L.Dąbie
Szczecin
Stargard
L.Miedwie
Grudziądz
Wisła (Vistula)
Baranovici
Białystok
Ostrołęka
Łomża
Bydgoszcz
Piła
Toruń
Ciechanów
Canal
GERMANY
Gorzów Wielkopolski
Warta
Włocławek
BELARUS
Berlin
Gniezno
L.Gopło
Poznań
WARSAW
Siedlce
Brest
Frankfurt an der Oder
Konin
Biała Podlaska
Magdeburg
POLAND
Skierniewice
Zielona Góra
Łęczno
Kalisz
Łódź
Głogów
Sieradz
Zduńska Wola
Piotrków Trybunalski
Radom
Lublin
Leipzig
Chełm
Legnica
Wrocław
Dresden
Zgorzelec
Kielce
Zamość
Luck
Chemnitz
Jelenia Góra
Częstochowa
Wałbrzych
Opole
Tarnobrzeg
UKRAINE
Kłodzko
Nysa
Gliwice
Sosnowiec
Katowice
Rzeszów
Krakow
Tarnów
Przemyśl
Lvov
Prague
Ostrava
Bielsko Biała
Krosno
CZECHOSLOVAKIA
Nowy Sącz
Plzeň
0 km 50 100 150
0 miles 50 100
Tatra
WESTERN CARPATHIANS
Ivano Frankovsk

HISTORY

In 1966 Poland celebrated the millennial anniversary of the nation, referring back to the day of Mieszko, who converted the country to Christianity. The history of Poland and its people portays periods of prosperity and hardship. The last two centuries appear to be the least prosperous for its people. By 1795 Poland ceased to exist as an independent nation, as the great-power nations partioned the country. Although the people were allowed to live and speak as Poles, they had no official nation to safeguard them.

Only at the end of World War I,was the country reestablished as a sovereign nation. The German invasion in 1939 put an end to this freshly aquired independence. During World War II Poland lost approximatly 25% of its entire population, and almost all of its Jewish population. Despite the alliance with the British and American forces, the end of World War II did not bring independence. Poland came under the sphere of influence of the Soviet Union, and was converted into a communist country with a centrally planned economy.

The end of the World War also included drastic changes within the borders. An area of 80-100 km. wide was lost to the Soviet Union, who claimed an extra buffer against the west. In exchange for this loss, the Western border was extended unto the rivers Odra and Neisse. This led to a forced movement of

millions of Poles from the east to the newly gained west. All in all, Poland lost over 70,000 square kilometres in this way.

POLITICS

During the period of Soviet influence, there have been three major periods of civil unrest;Poznan in 1956, Baltic cities in the seventies and the most famous and successful that of Solidarity in 1981. Despite tremendous initial successes, the Solidarity movement got overpowered during a period of martial law led by General Jaruzelski. The Martial Law was officially lifted in 1983.

Solidarity remained as an unofficial movement until 1988. In 1989 negotiations started between Solidarity and the Socialist Party (PUWP). Lech Walesa, the Nobel Prize winner and leader of Solidarity, was elected President in December 1990. The government, led by Hanna Suchoka, lost a vote of confidence and was forced to call an early election, which will be held in september 1993.

POPULATION

In 1991 Poland had a population of 38,900,900, which comes down to 124 persons/square kilometre. Warsaw is the capital, with 1,655,000 people. Other major cities are Lodz (851,000), Krakow (748,000),Wroclaw (642,000),Poznan (588,000),Gdansk (464,000) Sczecin (412,000) and Katowize (367,000).

Catholicism is the dominant religion (95%). The degree of urbanisation was just above 60.6%, the over all life expectancy lies at 71 years. (1986). More than 98% of the population over the age of 15 is literate. While Polish remained the main language, most people have a fair knowledge of Russian.

Over 98 % of the population are ethnic Poles, supplemented with small numbers of Ukrainians, White Russians and Germans.

THE ECONOMY

Although Poland has become more and more industrialized since the second world war, agriculture still plays a mayor role in its economy. In 1990 the Polish GDP measured around £ 43,330 million, or £ 1,112 per capita (Economist,1992). The four main sectors of the economy; industry,agriculture,

construction and others made the following contribution towards the GDP and the employment of the labour force.

Table 3.1 Sectoral contribution to GDP and employment.

	1985 GDP	Employment	1990 GDP	Employment
Industry (%)	41.3	28.4	36.2	28.0
Agriculture(%)	13.5	29.9	13.8	27.6
Construction(%)	9.5	7.5	9.3	7.3
Others(%)	35.7	14.7	4.7	14.3

Source: derived from Economist 1992.

The Polish industry is mainly based upon engineering, fuel and food. Within engineering, the main components are metal goods, machinery, and transport equipment. The fuel part is supported by the enormous coal reserves in Poland, which are estimated at 65.5 billion tons. Although Poland has to import its gas and oil from the former Soviet Union, Poland is self sufficient in its over all energy needs.

The foreign trade situation of Poland has changed vigorously over the past 15-20 years. The early seventies showed huge and expanding imports from the West, followed by government restrictions upon imports for the later part of the decade. The eighties were started with a trade orientation towards the East, but

ended with a trade orientation towards the west in 1990. In 1991 the export volume decreased for the first time in 10 years, with just over 1 %. In 1991 the EEC became Polands largest trade partner, accounting for more than half of the Polish exports and almost half of its imports. Over 1991 Poland exported for £ 347,069,000 into the UK, and it imported for a value of £ 313,828,000 from the UK.

Over 1990 the exports and imports of Poland were build up of the following components;

Table 3.2 Components of Polish trade in 1990.

	Exports	Imports
Fuel & energy (%)	10.3	27.5
Metallurgy (%)	9.9	5.6
Engineering (%)	37.6	38.5
Chemicals (%)	13.4	9.5
Wood & paper(%)	2.2	1.2
Light industries (%)	4.6	6.1
Food (%)	7.4	6.8
Construction (%)	5.8	0.1
Agricultural products (%)	6.0	2.2
Total incl. others (%)	100	100

Source: Economist 1992.

The Polish economy is faced with several serious problems. By the end of 1991 Poland had an international debt, mainly to the west of $ 48.3 billion (£ 32

billion). Between 1990 and 1991 the unemployment rate had nearly doubled from 6.3 % to 11.8 %, which comes down to 2,155,600 registered unemployed at the end of 1991. Hidden unemployment is not taken into account for these figures.

The Zloty. the Polish monetary unit became freely convertible at the beginning of 1990, which led to the following exchange rates.

Table 3.3 Exchange rates of the Zloty against the Pound Sterling.

1984	151.9
1985	190.6
1986	261.1
1987	477.2
1988	787.1
1989	2,359.9
1990	16,954.7
1991	19,777.1
1993	26,000.0

Source: Economist,1992.

3.2 POLISH AGRICULTURE

OWNERSHIP AND FARM SIZE

Poland has got 18.72 million hectares of land for agriculture use. Unlike the other former-communistic countries, Poland has never nationalized the land on a massive scale. Even before the political changes, private farms where of major importance. The breakdown of the area to ownership was following in 1990; Individually owned farms 72%, state farms 19%, cooperatives 4% and the catholic church 5%. The state farms varied in size between 4000 and 6000 hectares. Whilst more than 56% of the farms have less than 5 ha.See table 3.2. The state farms are now being privatised, but their size is to big to handle for farmers with experience of farming on a small scale.

Table 3.4 Poland's Farm Structure

	farm size (ha.)	# of farms (000)	% of farms
very small	0.5-1.99	775	28.7
small	2.0-4.99	742	27.7
Medium	5.0-9.99	685	25.5
Large	10.0-14.99	292	10.5
Very large	>15	188	0.1

Source: Industrial Institute of Agricultural Machines (Poznan) and the Institute of Food Processing Equipment (Warsaw),oct.1991.

EMPLOYMENT

The Polish agriculture and food processing industry employed 29% of the total workforce in 1990, which came down to 4.8 million people. The total rural population of Poland has remained stable since 1950, at approximately 15 million people. Due to migration however, the rural population is much older than the urban population. More than 20% of the farmers are of a post-productive age, and unlikely to adopt many changes. Farmers tend to be risk-minimizers as opposed to profit maximizers. This is a direct result of the discriminating treatment, private-farmers have received over the past four decades.

PRODUCTION

The main crops grown in Poland are cereals, potatoes and sugar beet. Their production characteristics for 1989 are presented in the table on the following page.

Crop	Area (000 ha.)	Yield (t/ha)	Production (000 t)
Wheat	2,196	3,85	8,462
Rye	2,275	2,73	6,217
Barley	1,175	3,33	3,909
Oats	803	2,72	2,186
Triticale	649	3.71	2,404
Rapeseed	583	2.74	1,597
Potatoes	1,859	18.5	34,391
Sugar beet	423	34.00	14,374
Apples			1,500
Strawberries			200
Currants			150
Plums/cherries /pears			240
Raspberries			30

Source: An agricultural strategy for Poland/ British Embassy

Furthermore livestock fulfils a key-role in Polish agriculture as it produces 46% of the value of agricultural production and 50% of the agricultural exports. Furthermore it uses 70% of the domestically produces grains and it is the main source of cash income for the small farms.

The total volume of agricultural production is very substantial. Nevertheless the output per unit of production is often 40-60% lower than in west-European states. The FAO estimates that Poland can produce enough food to feed a hundred million people (Times,1990).

MARKETING CHANNELS

Due to the modern history, Poland is lacking an efficient system for the collection,grading, distribution and marketing of agricultural goods. Under the communist regime a black market of considerable size has emerged. Black markets however entwine a lot of inefficiencies as well, and are not capable of sustainable growth. Improving the system of collection and redistribution will be of strategic importance for Polish agriculture and the urban population (World Bank,1990).

POTATOES

The importance of the potato to Poland and vice versa should become clear with some simple figures; Before the period of economic reform started, which had a temporary decreasing effect, the potato production in Poland was equal to the total potato production of the 12 EEC-member states. Secondly the consumption of potatoes per capita lies somewhere between 140 and 160 kg/capita/year, which is one of the highest in the world, and at least 40 % higher than the consumption of the Irish population, which in turn is the highest of the EEC. Approximately 10 % of the arable land is used for the production of potatoes.

Accurate figures about the destination of the Polish potato yield are difficult to obtain. There is quite a large spread in the percentages of different sources, but

the overall picture might be simplified to human consumption and seed 30 % of the yield, animal feed 45 % and wastage and losses 25 %. A quotation of several different estimates is presented below; Unfortunately it is not always clear whether the content of the categories is the same for each source.

Table 3.6 Potato distribution estimates.

Source	World Bank	Delleman	Hesen	Rostropowicz
Seed (%)		13	13	13
Ware (%)	15	15	14	15
Industrial (%)	7	5	6.5	7
Animal feed (%)	50	40	46	47
Losses (%)	28	26	20.5	15

More than 90 % of the total potato production takes place on private farms. The potatoes are grown in a rotation scheme of 5 years;potatoes, summer wheat,clover, winter wheat, and again potatoes. It should be noted that he trade of ware potatoes has never been under state control.

3.3 SEED POTATOES

Production and Distribution

Due to the large acreage in use for potato production, the demand for seed potatoes results to be equally large. Calculations of the total seed requirement come up with 4,6 million t of seed potatoes per year. (assuming to use 2,5 t/ha.). For 1988/1989 the seed production was only 455,000 t.(World Bank). This means that more than 90% or 4,15 million t of seed is taken from older generations. It also means that the substitution of new for old varieties and low quality seed will take a long time.

The production of seed potatoes has always been the domain of state farms. They produced original and elite seed, which they sold to Seed Production Central. Seed Production Central is a huge organisation including 200 breeding institutes for all kinds of crops, 17 main supply depots throughout Poland, and 200,000 ha. of testing land. Besides the Seed Production Central there is the Polish Agricultural Plant Breeding and Seed Production Company (Ltd), also called CENAS. Cenas is the successor of a the officially,dismantled Union of Agricultural and Horticultural Seed Production. The development of seed, as well as the breeding and multiplication of it is of an internationally recognized level of quality (World Bank,1990).

The further dismantling of state farms and central buying agencies, might well be counterproductive for the supply of certified seed potatoes. From 1986/87 to 1988/89 the production of certified seed has already fallen by 163,000 t. In order to increase the performance, the production of seed potatoes should at least triple the amount of 1988/89.

Apparently the seed is not treated against any diseases during the period of storage. It is left to the farmers to give additional treatments to the seed. The storage facilities both at bulk storage. as well as at individual farms are far from being sufficient.

There is virtually no spraying against blight on both certified and home-grown seed potatoes.

VARIETIES.

The Polish breeding programs have always been of a very high quality, a fact which is confirmed by both Scottish and Dutch experts. The technique of micro-propagation for instance has been in use for number of years. The number of varieties available in Poland is considerably large. For decades however the breeding has been aimed towards a high starch content, which excludes these varieties from use in the processing or ware industry (Delleman,1992). It is next

to impossible to make chips or crisps from these characteristically weak potatoes.

Another shortcoming of the existing variety list, are the early varieties. Early varieties seem absent, whereas them in particular are the ones that would give Poland an entrance to Western, hard currency markets. Foreign varieties can - officially- only be grown after a testing period of 4 years within Poland.

3.4 WARE POTATOES

The direct consumption of potatoes in Poland lies around 5.3 and 5.4 million t. (World Bank,1991). As some 40 % of the population still lives in the rural areas, almost half of this consumption is attributable farmers,their families, and neighbours. Approximatly 75 % of all consumed potatoes are bought directly from farmers. This indicates that there are few wholesalers who deal with significant amounts, and who can increase the quality awareness as well as the efficiency of the distribution network.

According to Western visitors the shape, quality and presentation of potatoes on the market places was unacceptable to western standards. Polish consumers alos

prefer good quality potatoes, but these tend to be very difficult to obtain. Many varieties were bred for a high starch content, which has adverse qualities for consumption. The most popular varieties for table use are Atol, Bryza and Bronka.

According to Prof. Roztropowicsz, from the institute Ziemniaka, the main solutions for a successful production and distribution of ware potatoes in Poland are:

-development of the potato industry as a whole

-increase of exports

-the establishment of an organisation to resemble the British Potato Marketing Board.

3.5 PROCESSED POTATOES

By 1987 Poland had 9 companies who processed potatoes, 5 chips/crisp manufacturers and 4 granulate/flake manufacturers. The chips and crisp producing companies have an annual input of 60,000 t. fresh potatoes (Heesen 1987), which should lead to ca. 12,000 t. of processed products.

One of the (private)crisp-factories near Warsaw had a capacity of 500 kg of fresh potatoes per hour. Some of the processing companies are furnished with Dutch equipment (Heesen 1987). The domestic market has been very positive towards locally produced crisps and chips. For Western consumers however the quality of the products is inadequate.

The four companies producing granulates and flakes, have an annual input of around 100,000 t. fresh potatoes. The Granulate factory near Glowno reports an intake of 35,000 t/year, and an output of 7,000 t. of granulates. The company was set up with technology and equipment from the American company Simplon. The company has also got storage facilities for some 18,000 t and besides granulates it also produces starch.(Heesen,1987).

Granulates and flakes are very suitable for the Polish conditions, as they are easy to store and transport. Approximatly 50% of the granulates and flakes produced in Poland were being exported during the 80s.

The small farm size is one of the major problems for the processing industry. In order to obtain raw material, companies have to visit a huge number of farms, that will eventually only provide them with a few tonnes. As the roads in rural Poland also have a bad quality, the collection demands a consirderable amount

of time and energy.

A large number of Polish companies are operating for not more than three months a year. Neither the companies nor the supplying farmers have adequate storage capacity, outwith the harvesting season.(Heesen,1987).

Most of the processing companies were state-owned, which means they are now likely to be privatized. This uncertainty, together with the frequent changes in the economic climate, make it difficult for managers to invest in modern equipment. The World Bank however sees the food processing industry as one of the main areas of economic improvement and offers cheap loans. The Polish government offers tax-holidays and tax breaks to investments within the processing industry.

NON-DOMESTIC

Japanese Mitsubishi has developed detailed plans for a potato-processing project in the North of Poland. It wants to grow potatoes on a former state-farm of 5000-6000 ha. Subsequently the potatoes are to be processed in a yet-to-build factory. The processed potato products will then be exported from Poland to the Middle-East. (Galien 1992)

PEPSICO-UK, a part of the PEPSICO-FOOD international, and holding company for WALKER Crisps, is building a crisp factory in Poland that should be finished by mid 1993. For this factory Pepsico is working closely together with several British companies for the supply of potato harvesting machinery and varieties which are suitable for processing. Pepsico obviously anticipates a growing market for Crisps within Poland. The total direct investment that Pepsico is making into Poland, involves $ 60 million over a period of five years. This investment also includes the building of a bottling plant (Economist,1991).

Dutch companies like Farm Frites and AVIKO have been exporting small quantities of processed products to the Polish markets. They sell their products through wholesalers, hotels and restaurants. The size of the market is increasing through purchases by: tourists, foreign business men, and Poles with an increasing disposable income. Up till now the Dutch exporters did not have plans to build factories in Poland, in the immediate future (Delleman 1992, CEBECO, 1992).

One of the advantages for companies to build plants in Poland rather than to export finished products, is the evasion of taxes. At the moment there is a 30% import tax on processed potatoes, directly followed by 7% of VAT. This means that almost 40 % of the wholesale price in Poland consists of taxes. (Delleman,1992).

3. 6 MECHANISATION

OVERVIEW

Polish agriculture still depends heavily upon manual labour and horsepower. (1.1 million horses are used on a regular basis). This situation is unlikely to remain unchanged over the next decade. Industrial wages and subsequently agricultural wages will rise as a result of modernisations and market mechanisms. The average farm-size will also have to expand in order to utilize the economies of scale like the West-European agriculture does.

Poland has about 1.1 million farm tractors, which comes down to 31 tractors per 100 farms. This is far less than for instance Italy which has 67 tractor per 100 farms, or Germany with 209. Most of the available tractors in Poland seem to be used as a means of transportation, rather as a means for production. (BE). It is estimated that only one in ten tractors has power-take-off-equipment. Power-take-off-equipment, which is essential for the use of modern trailers and cultivation-machinery.

Poland has got its own machine manufacturing industry, with some 30 medium-large companies. The largest company is URSUS, with an annual output of 70,000 tractors/year. Although more than 75% of all machinery is manufactured

domestically, it does not meet the farmers needs. R&D of the manufacturers was mainly targeted at the State-owned farms with 4000 ha. and more. More than 60% of the areable land however is owned private farmers with less than 10 ha. each.

Most of the 2.3 million families which are cultivating on the small farms, lack the money and larger-scale orientation to purchase appropriate machinery. In the past, state-organized companies, from which small farmers could rent the modern equipment, have been set up. These companies were very unpopular with the farmers due to their bureaucratic and inefficient practises. The World Bank on the other hand sees better opportunities for sort-alike organisations run by private contractors.

The lack of communication between manufacturers and farmers has led to the manufacturing ofinappropriate machinery for fertilizing, planting and harvesting. Furthermore in Poland there is a perpetual shortage of mechanic spare-parts and of an efficient distribution-network for spare parts. The lack of spare parts causes a tremendous loss of valuable machine-operating-time.

One of the problems of a greater use of machinery is the poor quality of rural roads and the lack of drainage in the fields. The low carrying capacity implies that machinery can't be used during all seasons, especially during wet conditions.

POTATO EQUIPMENT

The state of mechanisation for the growing of potatoes does not differ from other parts of agriculture. The Industrial Institute of Agricultural Machines in Poznan gave the following report of mechanisation in 1990.

Table 3.7 Level of mechanisation,1990

type of technology	state-farms	small-private farms
Soil cultivation (%)	92	54
Planting (%)	72	37
Potato-lifting (%)	62	40

Source: IIAM in British Embassy documents.

The construction of rows is far from sufficient, and row-making machines would be of excellent use. This equipment however was not available on the farms (Galienen 1992). The poor pre-harvesting practices, in combination with the inefficient loading of tubers by old equipment,leads to substantial losses. Especially for the seed potatoes, this way of handling and transport causes substantial losses. (World Bank,1991)

In the growing season spraying is only done in rare situations, although it is needed much more. It was to much of trouble, and the old-fashioned spraying-machinery was not very user-friendly (Galien,1991).

For the state of mechanisation for potatoes, the conclusion has to be that;" Modern,appropriate,effective, energy efficient agricultural machinery and equipment is needed,....tools for cultivation, harvesters,and potato lifting and loading equipment specifically"(British Embassy).

3.7 STORAGE

The lowest estimate for losses after harvesting start at 15 % (Rostropowics,1993), wihle other sources quote up to 40 %. This is more than 10 times the percentual loss of Great Britain. Even a moderate loss of 20% on

a production of 35 million t, leads to a figure of 7 million t, more than the total British yield. The reasons for these immense losses must be found in a treamendous shortage of appropriate storage facilities, combined with management failures in the transport of potatoes. The effect of different varieties on losses during storage can be neglected.

Private farms, which are the major producer, mostly store the potatoes in holes in the ground. The holes are then covered with a layer of straw and sand. This type of storage allows several animals to consume a part of the harvest, and at the same time it becomes vulnerable to fungi and bacteria.

On the other hand, state farms frequently store the potatoes in building without adequate ventilation. Whereas ventilation is the most important way to regulate humidity. The estimated storage capacity of reasonable quality was 300,000 t , less than 1 % of the national yield ! (Hesen 1987, Rostropowics 1993).

A number of losses occur due to phytophthora, rotting and occasional freezing of the tubers. Furthermore a lot of the potatoes are being kept in metal or plastic containers, which causes sever damages to the tubers. (Galien 1992).

The forementioned facts make it clear that Poland defenitly needs isolated and well ventilated storage facilities. At first priority should be given to the improvement of seed potato storage, as that is the factor that determines the success of new generations. Seed potatoes are known to be susceptible to a variety of diseases, which can be transmitted and plague next years crop. (World Bank,1991).

It is the small size of the farms that makes it difficult to improve the storage facilities. It is not justifiable from an economic point of view, to build large scale storage buildings on each farm. A direction in which a solution is most likely to be found, appears to be a collective storage and grading scheme.

4. COMPARISON AND CONCLUSIONS

4.1 COMPARISON

Poland is some 26 % larger than Great Britain,but the area that is being used for agriculture does not differ much between the two countries (5 %) In both countries the potato is a very important staple food, with consumption levels of more than 100 kg/head/year, far above the European average. The most important points of the countries, their agriculture and potato industry are shown in table 4.1.

From the information in Table 4.1 it is clear that Poland uses a much greater area of land, as well as more labourers and farm units for the production of its potatoes than Great Britain does.

The total yield of potatoes in Poland is 6-7 times larger than in Britain. In terms of production per labourer, farm unit or hectare, however the production in Britain is several times higher than in Poland.

Table 4.1 Comparison of Great Britain and Poland.

	GREAT BRITAIN	POLAND
COUNTRY		
Size (000 km^2)	230	312
Population (mill.)	54	39
GDP (£ 000 mill.)	416	43
GDP/head	7,720	1,112
AGRICULTURE		
Area(mill. ha.)	17.7	18.7
Farms (000)	237	2,682
Average farm size(ha.)	74.5	5
Tractors(000)	> 500	1,100
Tractors/farm	>2.1	0.4
Agriculture as % of GDP	1.5	14.5
Labour force (000)	566	4,800
% of labour force	2.1	29
POTATOES		
Seed demand (000 t)	500	4,600
Certified Seed use (%)	>65	< 10 %
Consumption kg/year	102	160
Average yield (t/ha)	35.8	18.5
Average production (mill. t)	6-7	34-38
Area (000 ha.)	154	1,859
Storage losses (%)	3	30
processing Capacity (000 t)	1,500	160
degree of Mechanisation	high	low

Another major difference between the countries are the storage losses which are around 3 % in Great Britain, and approximately 30% in Poland. If Poland was able to produce and store potatoes according to the common British practice, their supply of potatoes would increase by 250%, or in other words they could produce the present supply on 40% of the present area.

4.2 CONCLUSIONS

The potato industries of Great Britain and Poland have developed along different lines, as a result of the different economic and political organisation structure since 1945. At the moment,the potato industry of Great Britain is far more efficient and technically developed than the Polish one. The British industry is able to feed a population that is 25 % larger than the Polish one, while it using only 10-15 % of the area that Poland is using.

The opportunities for the British industry to increase the production without the use of extra land are very limited. For the Polish industry though, there exist genuine opportunities to either increase the existing production both in terms of quantity as well as in quality, or to continue producing at the present level with the use of far less arable land.

It may require Poland 20 years or more to reorganize the potato industry in order to achieve competative levels of production and quality with the the rest of Western Europe. The import of British know how, seed and equipment would excellerate the rate of development in the Polish potato industry.

The hypothesis for this study formulated in paragraph 1.3 stated that "Within the scope of the potato Industry, the establishment of intensive trade relations between Poland and Great Britain, including the transfer of technology, machinery and seed potatoes, will bring economic benefits to both countries."

The findings of this study did not falsify this hypothesis; on the contrary they brought forward numerous indications that Britain is capable of providing the goods and services that are badly needed by the Polish potato industry. On the Polish side there appears to be sufficient financial funds to uplift the industry, provide by organisations as the World Bank, EEC and UK-government.

The conclusion reached therefore must be that the establishment of trade relations between Poland and Great Britain will bring economic benefits to both countries.

5 A STRATEGY FOR TRADE EXPANSION

5.1 STRATEGIC QUESTIONS AND CHOICES

The principal conclusion of this study is that there are major business opportunities for Great Britain if it decides to assist the modernizing of the Polish potato industry. Cooperation and trade in potato related goods and services will be economically beneficial for both countries.

Considering the underdeveloped potential as a starting point, this chapter deals with the actions the British industry should undertake in order of benefiting from this potential. The future of the British potato industry is not directly linked with the future and fate of the Polish potato industry. The question is then, whether or not to develop these potential business oppurtunities. The choise whether or not to finally develop it can be made from a relatively luxurious position. This state of prosperity can also induce a rather lazy attitude towards materializing market opportunities.

The Polish strategy will not be discussed in this study; Firstly Poland affords virtually no other choice but to expand trade relations and import foreign goods and technology, in order to develop and modernize its potato industry. Secondly

the Great Britain is not the only country that is capable of providing what Poland needs; multinationals with home-bases in Japan, USA and the Netherlands have already started their activities in Poland. Even if the British goods and services were more appropriate for Poland than these supplied by other countries, Poland could not wait until the optimal partner arrived. Poland will proceed with the goods and services that are available; Great Britain can choose whether to participate in that scene, or not.

QUESTIONS AND CHOICES

The first priority for the British potato industry is to answer the question whether or not it wants to develop the potential trade relations which emerge in the case of Poland. Unless this question is answered clearly and sufficiently, the development will take place in a half harted way and cause a waste of British resources and international reputation. The advantages and disadvantages involved, for Great Britain in view of developing the existing trade potential are listed below;

Disadvantages of developing trade relation;

-Poland's volatile economy and political situation is such that can hamper the development of trade relations.

-The language barrier is considerable since Polish is the first language, Russian

the second, and English or German come third.

-If the Polish potato industry is raised to a level equivalent to the British, without a reduction in production area, Poland may oversupply the EEC- and British potato markets.

-Poland uses the metric system instead of the British system.

-Great Britain has rather limited experience, relative to what the Netherlands have for instance, in the export of potato related goods and services.

-The development of trade relations will require a serious commitment in terms of money, spirit and patience, towards cooperation of the parties involved in the British potato industry.

-Return upon investment is likely to be slow; Poland does not seem the place to make a lot of money fast.

Advantages of developing trade relations;

-The British potato industry has more chances of claiming an important position in the Polish market than in any other of the traditional markets. Traditional markets will be intensely defended by existing stakeholders, while new markets would offer much more opportunities.

-The British potato industry would gain invaluable experience from the export of potato related goods and services, which would benefit the industry in entering other, (both new and existing), markets.

-The UK-government and taxpayers have committed themselves in transferring large sums of money to Poland, under various schemes by the World bank, EEC and ODA. This means that Poland has got considerable purchasing power for selected goods, among which are the agricultural ones. Therefore it would be irrational not to involve the British potato industry in the modernizing process.
-Development of trade will be combined with cooperation between several partners of the industry. This would prove beneficial for the industry on every respect.

The choice wether or not to initiate trade relations with Poland should be made by the stakeholders of the British industry, after thorough discussion among them. The author of this study, being a foreign observer to the whole situation, holds the opinion that the Polish market is one of the most attractive for the British. The Dutch competitors seem rather hesitant to enter Poland, as they fear loosing market shares in the German market for ware potatoes. Britain should take advantage of this hesitation.

If the British industry decides not to exploit the Polish opportunity, it can refocuse its attention to its domestic market and carry on like it used to do for many years. Out of shear curiosity the stakeholder should get an answer to the

question why is it that his industry does not aim to develop overseas markets more forcefully.

When the British industry decides to exploit the Polish opportunity, it will have to employ a unified strategy. Such a strategy must clarify both to the people within the intustry, as well as to the end users in Poland what the aim and boundaries of the involvement will be. Unrealistic promises better be avoided at all times, as they could be counter-productive for both this specific market and others.

Working further towards a positive decision, the British industry must question which are the most urgent needs of Poland, which specific companies within Britain are willing to commit themselves to Poland, and which individuals will act as mediators and coordinators of the British and Polish sides.

5.2 EXPANDING THE TRADE VOLUME

The British strategy of exploiting the opportunities in Poland should include the following steps, namely holistic approach, focus of attention, physical presence, binding of stakeholders,use of international funds, exchange of information,piggybacking.

HOLISTIC APPROACH; The problems of the Polish potato industry are very diverse and interlinked. It would be of no practical use to solve these problems separetely. The introduction of varieties with excellent consumption qualities and twice the yield of the Polish ones is senseless, unless it is accompanied by increased storage and marketing facilities. On entering the Polish market one must be expecting, and willing to work on problems that seem quite distant from the potato scene. If communication proves to be a problem, bring in a fax machine. If fuel is a problem, buy or build some storage facilities.

In many ways Poland resembles the less developed countries, so one cannot rely on supporting industries until their support is proven. Working under the Polish conditions requires a flexible and open-minded attitude to the production of potatoes.

FOCUSED ATTENTION; Poland is slightly bigger than Great Britain, a fact that makes it impossible to serve the whole Polish market at once, although it might well be an ultimate goal. Companies like Agrico, Mitshubishi and McDonnald (see appendix ..) have good experience in starting with small plants that are capable enough to display the full range of possibilities. These small plants allow them to make small mistakes and win the experience that is essential for successful expansion.

The British attention should be focused on one or two regions in Poland that include an urban component and a scientific support centre. The three Polish potato research centres are located either near Warsaw or Kozalin, and authorities from these institutes have a very supportive attitude towards the British Industry

PHYSICAL PRESENCE; Physical presence within Poland is essential for a successful development of the existing potential. The British must get as close to the customer as possible. A pilot farm using the full range of British equipment, could clarify more to the Polish stakeholder than a hundred studies. Agrico for instance sends farm advisors to Russia in each planting and harvesting season. This kind of presence is invaluable for a successful outcome of the whole operation.

BINDING STAKEHOLDER; British companies in the potato industry have little experience in cooperating with domestic or overseas markets. Cooperation between companies with different products, is one of the main strengths of Cebeco, the Dutch agricultural export giant . It is essential that participating companies can count on each others support. This can be secured with a formalized contract of cooperation, describing the terms of involvement both in time as in money as well.

USE OF INTERNATIONAL FUNDS; The financial means available for the reconstruction of the Polish economy are impressive and underutilized. In 1990 the World Bank had reserved $ 1 billion for Poland, but could only disburse less than half, because there were not enough suitable projects. A similar situation occurred in later years with other funds. Exploring the opportunities of such funds is time consuming, but very worthwhile when looking at the financial reserves that still have to be disbursed.

EXCHANGE OF INFORMATION; Competition is a healthy phenomenon, which is accompanied by the withholding of inside information. When operating in overseas markets, with British companies that are more complementing than substituting each others products, inside information should not be withheld. Information and experience is expensive to obtain, and it is irrational to withhold such information from colleagues who serve a different part of the potato industry. The sharing of information and experience across company borders are one of the main success factors of both Japanese companies and the Dutch potato industry.

PIGGYBACKING; Several large multinational companies, like Mitshubisi and Pepsico, have already committed themselves to the further development of the Polish potential. These companies offer several opportunities for British companies to supply them with equipment and services and to help them out. Mitshubisi is using potato harvesters from Scotland on their plant in North-West Poland. Pepsico uses Scottish seed for the production of crisps in Poland. These kind of symbioses bring forth a wealth of information and expertise for future projects.

A1 LIST OF ABBRIVIATIONS

BONIN	Institute for Potato Research (Poland)
CIP	International Potato Centre
EAPR	European Association for Potato Research
EC	European Community
EEC	European (Economic) Community
FAO	Food and Agricultural Organisation
IBMER	Institute for Building, Mechanisation and Electrification in Agriculture
MAFF	Ministery of Agriculture Fisherires and Food
PMB	Potato Marketing Board
PMS	Potato Marketing Scheme
ODA	Overseas Development Agency
SAC	Scottish Agricultural College
SCRI	Scottish Crop Research Institute
SET	Scottish Enterprise Tayside
SIRP	Scottish International Resource Project
SSPDC	Scottish Seed Potato Development Council
SOADF	Scottish Office Agriculture and Fisheries Department
TPS	True Potato Seed (botanic)
WAU	Wageningen Agricultural University

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BIBLIOGRAPHY

BEKSIAK,J.,GRUSZECKI,T.,JEDRASZCYK,A,WINIECKI,J., The Polish Transformation: programme and progress, Centre for Research into Communist Economies,1990.

BISHOP,C.F.H.,MAUNDER,W.F., Potato mechanisation and storage, Farming Press Ltd, 1980.

BONNOMA,T.V.,The marketing Edge, The Free Press,1985.

BRAVERMAN,A., et. al.,The agricultural transition in Central and Eastern Europe and the former U.S.S.R, World Bank, 1993.

CARGILL,B.F., The potato storage, design, construction, handling and environmental control,American society of agricultural engeneers, 1976.

CEBECO, Anual Report 1992, CEBECO-Rotterdam,1992.

DELLEMAN, J.," Warming-Up in Polen", Aardappelwereld, vol 10, pp.11-12, October, 1992.

DYKER,D.A.,The national economies of Europe, Longman Group Ltd, 1992.

ECONOMIST INTELIGENCE UNIT, Poland Country Profile,Economist Inteligence Unit,1992.

ENNEW.Ch. et al, An (un)common Potato Regime for Europe ?, University of Nottingham, 1993.

EUROPEAN ASSOCIATION for POTATO RESEARCH, Abstracts 11th Triennial Conference of the EAPR,EAPR,1990.

EUROPA PUBLICATION ltd.,The Europa World Yearbook 1992, Europa Publishers Ltd.,1993.

FAO, Trade Yearbook, Food and Agricultural Organisation, various years.

FAO, Production Yearbook, Food and Agricultural Organisation,various years.

FAO, The Agricultural Commoditiy Projections to the Year 2000, Food and

VAN DER GALIEN, M.,"De Landbouw in Polen", Aardappelwereld, vol 10, pp., October, 1991.

VAN DER GALIEN, M.,"Aardappelen in Polen", Aardappelwereld, vol 9, pp.17-18, September, 1992.

GUTTERIDGE.M.J.,Potential for Scottish Seed Potato Exports in Sub-Saharan Africa, University of Edinburgh,1983.

HAVLEK,P.,Dismantling Command economies, Westview Press,1991.

HARRIS,P.M., The Potato Crop; the scientific basis for improvement, Reading University,1992.

HESEN, J.C.,"Aardappelen in Polen", Aardappelwereld, vol 7, pp.10-14, July, 1987.

HOOGH de J.,SILVIS.H.J, EG-Landbouwpolitiek van binnen en van buiten, Pudoc Wageningen,1990.

HORTON,D, Potatoes; Production, Marketing, and Programs for Developing Countries, Westview Press, 1987.

HSMO,Britain 1992 an official Handbook, Her Majesties Stationary Office,1992.

HUGHES,R.D. et al, A Comparative Study of Agricultural Marketing in the Netherlands and the United Kingdom, Wye College of London,1993.

KAYNAK,E.,Marketing and Economic Development, Praeger Publishers,1986.

KOLANKIEWICZ, G., LEWIS,P.G., Poland,politics, economics and society.,Printer Publishers, 1988.

LAMENTOWICS,W.,OSTROWSKI,K.,PERCZYNSKI,M., Eastern Poland and Democracy; the case of Poland, Institute for East-west Security Studies, Polish Institute Of International Affairs.,1990.

LEEFLANG,P.S.H, Probleemvelden in Marketing,Stenfert Kroese,1988.

MINTZBERG,H,QUINN.J.B, The Strategy Process, Prentice-Hall,1991.

NELSON,H.D., Poland a country study, The American University Washington,

PETERS,T, Liberation Management, MacMillan,1992.

POLISH EUROPEAN COMMUNITY-WORLD BANK TASK FORCE, An agricultural strategy for Poland,World Bank, 1990
1984.

POTATO MARKETING BOARD,Potato Statistics in Great Britain 1982-1986, Potato Marketing Board, 1987.

POTATO MARKETING BOARD,Potato Statistics in Great Britain 1987-1991, Potato Marketing Board, 1992.

RASTOVSKI,a,van ES A. et al, Storage of potatoes; Post-harvest behaviour, store design, storage practice, handling, Centre for Agricultural Publishing and documentation Wageningen, 1981.

RENIA, H.M., International Potato Trade, The Dutch Performance 1970-1990, Wageningen Agricultural University, 1992.

RITSON.C,Warren.R, Agriculrure's Marketing Environment, Potato Marketing Board, 1985.

RUGMAN,A.M.,LECRAW,J.L.,BOOTH,L.D., International Business, Firm and environment, McGraw-Hill Book Company, 1985.

SAC,Potato Newletter, Scottish Agricultural College, various issues.

SCOTT,G.J.,Markets,Myths and Middlemen,International Potato Centre,1985.

SMITH,G.D;ARNOLD,D.R;BIZZEL,B.; Business Strategy and Policy,Houghton Mifflin Company,1991.

SSPDC,Annual report, Scottish Seed Potato Development Council,various years.

TIMES,Farmers dig for victory under the post communist order, Times, 14 March 1990.

THOMPSON,K.W., Poland in a World Change, constitutions,presidents and politics, University Press of America, 1992.

WORLD BANK, Poland agricultural sector adjustment loan supporting volumes I,III and IV, World Bank,1991.

YOUNG,N., The European Potato Industry, Wye College/ Potato Marketing Board,1981.

YOUNG,N.,Seed potato systems in Developed countries;Canada, The Netherlands and Great Brittain,International Potato Centre,1990.

ZAAG VAN DER,D.E. Potato production and utilisation in world peerspective with special reference to the tropics and subtropics,in Potato Reasearch 26 (323,362), 1983.

ZAAG VAN DER, D.E., The potential demand for seed potatoes; a world perspective, in Potato Research 29 (541-548).,1986.

ZWASS,A., The economies of Eastern Europe in a time of change, MacMillan Press,1984.

PERSPECTIVE 2.1

McDonald's Goes to Moscow

The Soviet people eat meat and potatoes. McDonald's sells meat and potatoes. Therefore, McDonald's should open fast-food restaurants in the Soviet Union. This vision of international expansion—which sounds simple enough—cost George Cohon, president of McDonald's of Canada, some $50 million dollars and took him fourteen years to realize. It wasn't easy to introduce a highly standardized product and service into a society with very different social expectations and styles.

Take the problem of basic ingredients. While the Soviet Union raises its own cattle and grows its own potatoes, it does so in a highly regulated way. It has five-year plans, under which distribution is regulated. McDonald's was not part of anyone's five-year plan. And even if the fast-food giant had been part of such a plan, it would not have found the Soviet meat and potatoes quite right for its highly standardized Big Macs and fries. Accordingly, McDonald's, committed to dealing with local suppliers, imported potato seeds from its farm in the Netherlands and taught Soviet farmers how to produce beef to its exacting specifications.

Or take the problem of service. Eye contact and smiles, as obligatory as uniforms in the McDonald's system, are not automatic in the Soviet Union. Therefore, counter servers had to be instructed in professional cheeriness. Soviet managers—specially trained abroad—carried out this instruction.

Or take the problem of local eating habits. Unaccustomed to eating with their hands, Soviet people would tend to take their Big Macs apart and eat them with knives and forks. McDonald's mounted an ad campaign to show the right way to consume its burger sandwiches.

With the prospect of 290 million Soviet stomachs to fill, McDonald's of Canada is determined to build a local operation. The company is acting in partnership with the Moscow City Council Department of Foodservice. Its first restaurant sells its goods in Soviet rubles, rather than in the foreign currency demanded by most establishments offering exotic or expensive products. McDonald's first outlet, with 900 seats, 700 of them indoors, is regarded by the company as much as a training center for future McDonald's units as it is as a restaurant.

References: Ann Blackman, "Moscow's Big Mak Attack," *Time*, February 5, 1990, p. 51; Scott Hume, "How Big Mac Made It to Moscow," *Advertising Age*, January 22, 1990, p. 51ff. Rushworth M. Kidder, "What Moscow's Big Macs Mean," *The Christian Science Monitor*, February 12, 1990, p. 13. Reuters, "Soviet McDonald's Serves 30,000 Daily," *The New York Times*, March 1, 1990, section D, p. 5, col. 3, late edition.

II. POTATOES: TRADING PROSPECTS

1. Elements of Potatoes' Trade Balance

With production amounting to 32 to 36 million tons of potatoes (from 1.8 million ha), Poland is the second largest European producer after the USSR. It produces varieties for consumption, animal feeding and industry; late and medium-late varieties are dominant in the structure of production.

Because of the relatively high labor consumption of potato growing, their production is mainly confined to the private sector of agriculture (93 percent of cultivation area and 91 percent of crops in 1989). There has been a steady decrease in the production in recent years, due to the reduction of cultivation area as well as lack of progress in getting better crops.

The domestic consumption of potatoes recently comes to ca. 33.5 million tons (compared to 36 million tons in 1985). According to the Chief Central Statistical Office (GUS), about 50 percent of that amount is used as fodder. The direct consumption (whose level is lowering per capita) is at the stable level of 5.3 to 5.4 million tons (15 to 16 percent of domestic consumption), including ca. 2.5 million tons of farmers' self-supply. About 7 percent of the domestic consumption is meant for industrial use.

The yield of marketable agricultural produce is low (25 to 28 percent); the purchase comprises about 56 to 60 percent of potatoes' production. The purchase of potatoes is stabilized at the level of 4.7 to 4.9 million tons (75 percent of which supplies from individual farmers) and is conducted by various economic subjects, since it has never been monopolized by the state. The purchase for consumption and export needs is conducted by Gardeners' Cooperatives (Spoldzielnie Ogrodnicze) and "Samopomoc Chlopska".

The purchase of potatoes is also conducted by potato processing factories grouped in 15 state enterprises as well as by alcohol distilleries based on state farms (PGR), which cooperate with alcohol industry factories supplying them with raw alcohol. The amount of potatoes purchased by the potato industry has diminished recently from ca. 3.0 million tons in 1985 - 1986 to ca. 2.2 million tons in 1989, also as a result of the Law of Education in Sobriety, which imposed restrictions on the production of spirits.

About 50 percent of the amount purchased by the potato industry is used for the production of pure alcohol; the second major profile of processing is the production of potato flour, which on the average amounts to 145 to 199 thousand tons, the maximum input of potatoes reaching 1.3 million tons. Other processed products include potato syrups, glues, dextrines, etc. Limited processing facilities as well as poor quality of potato account for the small scale of their processing and the assortment of potato products is very narrow (it includes mainly potato noodles (pyzy), chips, potato cubes, etc.).

2. Direct and Indirect Export of Potatoes

In 1989, only 0.8 million tons of potatoes (2.0 percent of the home production), especially edible varieties and see-potatoes, were exported. The

export of unprocessed potatoes varies considerably—in recent years the amounts exported fluctuated between 0.13 and 0.8 million tons. East European countries (especially the USSR) have constituted major export markets for years. The markets of the 5 countries of the region (USSR, Romania, Bulgaria, Czechoslovakia and the former GDR have absorbed so far 90 to 95 percent of the unprocessed potatoes export and 90 to 95 percent of the export of seed potatoes. Apart from spirits another staple potato product exported is potato flour. Its export is not stabilized either, fluctuating from 10 to 25 thousand tons. The main recipients are European countries (Holland, Germany, Great Britain, Austria and Japan). The markets of 9 European countries and Japan absorbs 75 to 95 percent of its total export. It should be noted that the possibilities of increased supply considerably exceed the prospects of selling it on the world markets.

3. Anticipated Trends in Potato Production, Consumption and Trade

Considering the development in potato production it is clear that by 1995 the recent downward trend in cultivation area and crops should continue. Processes leading to the increase in the number of larger farms as well as continual elimination of potatoes (as too energy-consuming and therefore too expensive feed) from animal feeding will influence the reduction of potato growers and cultivation area. The reduction of cultivation area will coincide with increased yield in potato growing, which, however, will not compensate for the effects of crop decrease caused by the diminished cultivation area. As a result, the average potato production in the years 1991 to 1995 may fall to the level of ca. 30 million tons, i.e., it would be about 6 million tons smaller than in 1990. It is to be expected that a reduction of crops will be connected with the process of specializing in the production of specific varieties of potatoes: edibles, industrial or feed ones.

As for anticipated domestic consumption of potatoes, it should be expected that, like in the case of cereals, the level of direct consumption will not be subject to any significant change. Because of limited food processing facilities of potatoes as well as lack of varieties suitable for industrial processing, they will be mainly consumed in unprocessed form. At the same time a decrease in the consumption of potatoes for feed purposes can be expected, especially in farms which are going to expand their area.

The export of potatoes from Poland has never been restricted by the mere amount of the domestic supply, whereas the quality of unprocessed potatoes has often been unsatisfactory. The edible varieties of potatoes produced in Poland can well be consumed unprocessed in the household. However, the world market for such produce is vary small; in fact it is limited to East European countries. Poland cannot offer any varieties suitable for food processing at an industrial scale, for which there is a strong demand. For this reason, the future export of potatoes will continue as long as there is a demand in East European countries and as long as the export of potato flour is profitable. In the next four years, however, it is unlikely to hope for any serious surplus of potato products which might be exported at acceptable prices.