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A B S T R A C T

The objective of this study is to analyse the supply and demand for food and drink packaging products in Uzbekistan, and the role of government in supporting the packaging sector. The report is divided into 8 sections. Following this introduction is a section on problem definition. Analysis is divided into 4 sections: demand for packaging products, supply of packaging products, foreign currency expenditure, and waste management. The report finishes off with conclusions and recommendations regarding the role of government in supporting the packaging sector.

Keywords: The Republic of Uzbekistan, Uzbek Industry, Package Industry, Fruit, Vegetable and Wine Association Institute, Food Industry Association, Meat and Dairy Association, Oil, Fat and Tobacco Association, Building Materials Concern (glass production).

**Abdukakhkhor Abduganiyev was a visiting research fellow in the Department of Agricultural Economics, August-November 1999. This research was done in conjunction with Food and Agricultural Policy Advisory Unit, Ministry of Agriculture of the Republic of Uzbekistan.

1.0 Introduction

The objective of this study is to analyse the supply and demand for food and drink packaging products in Uzbekistan, and the role of government in supporting the packaging sector. The report is divided into 8 sections. Following this introduction is a section on problem definition. Analysis is divided into 4 sections: demand for packaging products, supply of packaging products, foreign currency expenditure, and waste management. The report finishes off with conclusions and recommendations regarding the role of government in supporting the packaging sector.

There is another, separately-bound paper consisting of appendices which support this main report. Appendices include more detailed analysis in the following topics: demand for packaging products (by food and drink sector), glass packaging, metal packaging, paper and board packaging, and plastic packaging.

Demand for many packaging products has decreased substantially over the last 3 years. Management in the 3 largest manufacturing plants complain of a lack of demand in the food industry and an inability of processors to pay for packaging products. This begs the question: *is there a packaging shortage?* Food processors, on the other hand, argue that poor quality of domestically-manufactured packaging products is the issue: processor demand would increase if the manufacturers produced better quality packaging.

But poor quality packaging products available in Uzbekistan is just one of many factors which has led to this decrease in processor demand for domestically-manufactured packaging products. Former state processing enterprises, which account for a large percentage of packaging product purchases, have benefited from recent privatisation steps but enterprise management is still constrained on a number of important fronts. Given these constraints and the need for processor investment in new filling and closing lines, the response of these processing enterprises to the availability of improved packaging, in terms of packaging product purchases and processed food sales, could be slow.

The research team put together a projection for processor and consumer demand for packaging products over the next 15 years. Many of the projections were based on information provided by steering committee members. The team projected steady growth in the demand for glass and steel packaging products, and exponential growth for aluminium, plastics, paper (see Annex B).

Investment in the Uzbek packaging industry (manufacturing and converting) is contingent on production economies of scale, which vary substantially between sectors. Current demand for most packaging products is insufficient to justify current large-scale investment in manufacturing (eg, twist-off and pry-off jars, wine bottles, steel cans, paper and board); strong export demand could alter prospects. Current demand for some packaging products could be sufficient to justify investment in manufacturing (eg, sparkling wine bottles) and converting (plastics, paper and board).

Projected processor demand for the year 2011, on the other hand, indicates substantial large-scale investments in the manufacture of packaging products (glass containers, paper and board products, steel closures) and in converting operations (plastics, paper and

board) over the next 15 years. Proposed polyethylene production in Uzbekistan could account for as little as 25% of overall plastics requirements for food and drink packaging.

Manufacturers of packaging products have submitted proposals to government specifying plant and equipment investments to respond to buyer concerns. Manufacturers of glass, paper and board, and lacquered steel plate in Uzbekistan benefit from a monopoly position and, in some cases, from the inability of processors to import competitive packaging products. Steps have already been taken to restructure and privatise the monopoly suppliers of glass, paper and board, and lacquered steel plate, but further steps would improve chances of private sector investment in plant improvements.

Developing competition in the short-run does not necessarily equate to government investment in new plant and equipment in Uzbekistan. In cases where current demand might not justify immediate investment, another option for competition is to allow imports until increased processor demand justifies private investment in packaging product manufacture.

The projected increase of foreign currency expenditure on paper and board products is potentially enormous.

Waste generated from food and drink packaging is projected to increase 5-fold in volume and 12-fold in cost over the next 15 years. Paper and board products are potentially the fastest growing and the largest contributor to refuse levels. Recent technology advances have yielded re-pulping and papermaking equipment which can produce quality paper for corrugated board manufacture from recycled materials.

The research team makes the following policy recommendations:

- The government needs to take further steps to improve the business environment for processors, especially former state enterprises, and packaging manufacturers.
- One short-term solution to improve the supply of good quality packaging products to Uzbek processors is to improve the availability of foreign currency to processors for importing packaging products. This would help processors and also provide competitive incentives for domestic packaging manufacturers to lower costs, improve quality, and regain market share.
- The most attractive government investment is in the expansion of existing infrastructure to improve paper and board recycling. The financial returns and social benefits from this investment are substantial.
- Other recycling programmes, especially for steel, aluminium and glass should be considered at the same time. It is likely that glass recycling, as compared to present re-use, will increase substantially over the next 10-15 years.
- Other government investments in packaging manufacturing could be premature. When demand builds to a level where a financial return can be achieved, private sector incentives should be considered instead of direct government investment.
- The government should consider further steps to increase managerial and financial independence of packaging manufacturing plants. This will enhance opportunities for private sector financing for new plant and equipment.
- Building on recycled material requirements from manufacturing plants (Angren, Kuvasai), a recycling strategy should be developed to cover the next 15-20 years,

including targets for major refuse categories. Private sector involvement should be considered at all levels.

I benefited from the guidance and support of the following steering committee members:

- Fruit, Vegetable and Wine Association Institute
- Fruit, Vegetable and Wine Association
- Food Industry Association
- Meat and Dairy Association
- Oil, Fat and Tobacco Association
- Building Materials Concern (glass production)
- Furniture Association (paper and board production)

2.0 Problem definition

Research indicated the following key problem areas in the food and packaging sector in Uzbekistan:

- Many food and drink processing companies, which determine demand for packaging products and the financial health of the packaging manufacture industries, are performing badly. A large percentage of these processors are former state enterprises. The reasons for this poor performance are diverse; poor availability of quality packaging is only one of many factors constraining processing firms.
- Poor quality glass, steel and board products are being produced domestically. This hurts the competitiveness of food processing firms which do not have access to foreign currency to import alternative packaging products.
- Current investment in equipment to manufacture packaging products and to fill food and drink products is focused on plastics and board/laminates, both of which require foreign currency for all raw material purchases.
- Waste disposal management problems will intensify as the use of food packaging multiplies. This will be exacerbated by investment in non-recyclable and non-reusable packaging systems, such as most plastics, and the increased use of secondary packaging.

3.0 Demand for Packaging Products

Demand for many packaging products has decreased substantially over the last 3 years:

- The Angren paper and board plant (under the Furniture Association) is working at 30% of previous production levels and 17% of capacity.
- The Kuvasai "Quartz" glass plant (under the Building Materials Concern) is working at 50% of previous production levels (for glass jars and bottles).
- The Yangiyul steel plate lacquering plant (under the Fruit, Vegetable and Wine Association) is working at 35% of previous production levels.

Management in the 3 plants complain of a lack of demand in the food industry and an inability of processors to pay for packaging products.

This begs the question: *is there a packaging shortage?* From these low demand figures, it would appear that there is not. Food processors argue that poor quality of domestically-manufactured packaging products is the issue: processor demand would increase if the manufacturers produced better quality packaging.

Poor quality is just one of many factors which has led to this decrease in processor demand for domestically-manufactured packaging products. Most processor demand for Uzbek-manufactured packaging products comes from former state enterprises[1]. Even though government has achieved substantial progress toward privatising these food and drink enterprises, management is still constrained on a number of important fronts:

- Many enterprises do not have the right or the means to import packaging products and equipment or to export final products.
- Despite progress on price liberalisation, prices for raw and final products are sometimes controlled by local government and commodity associations. This undermines management initiatives to improve quality and distribution, and lower costs. Some commodity associations, such as the Fruit, Vegetable and Wine Association and the Meat and Dairy Association, are working to remove local government price controls on raw product in order to revitalise primary production for processing.
- Existing controls on banking, salary levels, and the use of cash, constrain the whole food processing sector and discriminate against former state enterprises. Restrictions are also cutting the ability of processors to procure sufficient raw product: farmers, especially small farmers, prefer to sell their produce for cash. The effect of these banking restrictions is most apparent in the meat and dairy processing sectors, where small-scale independent processors benefit from the ability to use cash, in comparison to the former state enterprises, which cannot.

More processor demand for better quality packaging products could be met by imports given availability of restricted foreign currency for this purpose. The Fruit, Vegetable and Wine Association, for example, imported jars from Hungary and Lithuania, which were only 25% more expensive than lower quality jars from Kuvasai.

The Furniture Association and the Building Materials Association agree that investment is required to improve the quality of domestically-manufactured packaging products. But current processor demand for most packaging products is insufficient for manufacturers to achieve a return on proposed investments. A key question for investors and government, therefore, is *how much investments in packaging manufacturing will improve sales of processed food and drink products and, hence, of packaging products?* Given above-mentioned constraints on many former state enterprises, it is doubtful that processed food sales will respond sharply to the availability of better quality packaging.

Another argument against the immediate impact of some manufacturing investments is the need for processor investment in new filling and closing equipment to accommodate new packaging products. The development of demand for twist-off jars, for example, will be slow: canneries will need to invest substantially in new filling, closing and sterilising / pasteurising equipment before larger-scale production is possible.

Certainly, whatever policy steps government takes on food and drink packaging, it must address the need to increase demand for packaging products by improving the business environment for food processors. The financial health of the food processing sector, including investment in new filling equipment to accommodate new packaging products, is evidently the key component to investment into and the financial status of packaging manufacturing industry.

[1] At present, private sector investment is chasing other types of packaging, such as plastics, which are import-oriented and afford independence from former state manufacturing enterprises.

A first step for the research team was to put together a projection for processor and consumer demand for packaging products over the next 15 years. The team employed a variety of sources. Some steering committee members submitted their projections. The team also employed data from the Uzbek Institute of Medicine of the Academy of Medical Science on recommended levels of food intake (see Annex A). In addition, western Europe per capita data for the consumption of various packaging product types were employed to identify possible trends[2]. Finally, population growth was projected to continue to grow at 1.8%, and the economy to grow at 2% for the next 7.5 years, and 6% for the subsequent 7.5 years.

The research team projected steady growth for glass and steel packaging products, and exponential growth for aluminium, plastics, paper (see Annex B). More detailed analysis for each packaging group (glass, metals, plastics, paper and board) can be found in the separately-bound appendices.

Demand for new glass bottles could increase as processors begin using more new and less re-used glass. It is projected that demand for twist-off jars will develop slowly as processors start to invest in required new closing and pasteurisation/sterilisation equipment. In 1996, some canneries in the Fergana region had the opportunity to test trial quantities of twist-off jars manufactured by the Kuvasai plant. Given substantial current demand for sparkling wine bottles at 65-70 million new bottles per year, sparkling wine could represent a large percentage of future demand for glass bottles. This is supported by the fact that re-use of sparkling wine bottles is impractical and, unlike many other alcoholic beverages, sales to other FSU countries have remained strong.

Demand for steel products is projected to focus on bottle and jar closures; demand for food cans could dissipate as the 9-litre cans are replaced by aseptic bags for bulk tomato concentrate packaging. Consumer demand for aluminium beverage cans is projected to grow steadily, and processor demand for aluminium foil and tray products to grow 140-fold (see Annex B).

Demand for paper, board (including laminates) and corrugated board is projected to reach 60% of European per capita levels by the year 2011. The increasing use of corrugated board boxes and trays for secondary packaging of retail packs could increase demand for corrugated board 25-fold.

Demand for plastics is fragmented by the wide range of products and manufacturing systems. With the development of a new bottling plant in Samarkand, over 90% of current demand for plastic food and beverage packaging is for the expensive polytetraphalate (PET). Processor demand for high-density polyethylene (HDPE), currently at 3% of European levels, is projected to increase 20 times because of the development of polyethylene production in Uzbekistan and a possible shift to HDPE for fresh milk packaging.

Demand for packaging products made from other plastics is less than 1% of European levels. Demand for bottles, film and injection-moulded products made from these other plastics is projected to increase 20-40 times (see Annex B).

[2] Data on European per capita consumption of packaging types came from a 1993 survey at retail level. Even though this data represents consumer demand, it can be extrapolated to represent processor demand for packaging products for the purposes of this study. This is justified by the fact that most processed food and beverage products bought by European consumers will have been produced in Europe and, therefore, processor and consumer demand are roughly equivalent.

4.0 Supply of packaging products

The supply of all packaging products comes through one of 3 channels:

a. packaging products which are manufactured domestically then transported to the processor (eg, glass jars and bottles, corrugated board)
b. packaging products which are manufactured by the food processor (eg, plastics, some steel cans)
c. imported packaging products (eg, laminated drink containers, bulk aseptic bags)

The first supply channel merits careful government consideration. Current suppliers of glass, paper and board, and lacquered steel plate (for can bodies) in Uzbekistan benefit from a monopoly position and, in some cases, from the inability of processors to import competitive packaging products. Many food processors complain that these monopolistic suppliers are not pressured to improve quality and to respond to changing processor and consumer preferences.

The suppliers, on the other hand, have submitted proposals to government specifying plant and equipment investments to respond to buyer concerns. The Kuvasai glass concern, for example, has submitted 3 investment proposals to government totalling USD$ 32 million; the proposals address most processor concerns, including glass clarity, weight and transport packaging. The Angren paper and board plant has submitted similar investment proposals.

There is little doubt that more competition would improve the situation. But competition in the short-run does not necessarily equate to new plant and equipment in Uzbekistan. In some cases, another option for competition is to allow imports until increased processor demand justifies more investment in packaging manufacture.

Steps have already been taken to restructure and privatise the monopoly suppliers of glass, paper and board, and lacquered steel plate, but further steps would improve chances of private sector investment. Despite 51% state ownership of the Kuvasai glass manufacturing concern, plant management appears to have control over the choice of suppliers and buyers. But in terms of corporate governance, more financial and management independence could improve performance and private sector investment opportunities. With less than 51% state ownership, the Angren and Yangiyul plants appear to enjoy independence on many pricing and corporate governance fronts. The two plants would certainly benefit from a reduction in high export duties to generate export sales (to help fill underutilised capacity), and independent foreign currency access with minimum government fees.

Investment in the Uzbek packaging industry (manufacturing and converting) is contingent on production economies of scale, which vary substantially between sectors. In terms of financial investment analysis, a manufacturing operation must build sufficient capacity to produce low-cost, competitive packaging products, and generate sufficient sales to yield a return on investment. If processor demand (i.e., sales of packaging products) falls far short of planned capacity, income will not be sufficient to generate a return on equity and debt, and private sector investors will not go ahead with the investment.

Economic investment analysis, which attempts to measure investment costs and benefits from a country rather than financial perspective, is another possible approach for analyzing investments. Unfortunately, comparative advantage (eg, domestic resource

cost) and cost-benefit analysis, two forms of economic analysis, fail to yield good data for comparing investment or production in different packaging sectors. The main problem lies in the fragmented nature of many packaging sectors (manufacturing and converting) and the heavy use of intermediate products.

Within the glass packaging sector, projected demand for containers in the year 2011 is projected to exceed current supply by 840 million bottles (336,000 tonnes) and 90 million jars (19,800 tonnes)[3]. This requirement can be met in a number of ways, including imports, improvements to Kuvasai, and large investments into new glass plants. New investment in sand enriching operations in Uzbekistan is an integral component of improved and new glass manufacturing plants. Current sand supplies for the Kuvasai plant come from Tajikistan; the sand has a high iron content, which results in unclear glass. Both the Building Material Concern and the Fruit, Vegetable and Wine Association have developed feasibility studies for sand enriching operations. Capacities for economically-sized plants are roughly 200 million units for bottle production (cost indication: US$ 30 million), and 300 million units for jar production (cost indication: US$ 60 million)[4].

But the question still remains: is there sufficient current demand to justify investment now in glass manufacturing? According to projections, demand for jars (twist-off or pry-off) and wine bottles is insufficient to justify large-scale investment. Sparkling wine bottles could be the exception: current demand and projected processor demand could be sufficient to justify current investment.

Comparative advantage analysis is somewhat useful in looking at glass production in Uzbekistan. There is little question that social benefits from glass production outweigh social costs. This relates to the fact that sand (silica), a domestic resource with little value outside glass production, is available in Uzbekistan. This advantage is evidently contingent on investment in sand enriching in Uzbekistan; current sand supplies are imported. The estimated domestic resource cost (DRC) is the ratio 0.37, implying US$ 2.70 of foreign currency saved for every US$ 1.00 of domestic resources employed.

Projected dwindling processor demand for food cans[5] could serve to discourage new investment in can manufacturing. The Uzbek industry is based on outdated soft-soldered side seam technology. The minute demand for smaller, retail size cans does not justify any investment in new welded side seam technology. The minimum economically-sized plant would have a capacity of 63 million cans per year, as compared to a projected demand not exceeding 2-3 million cans.

Regarding steel jar closures, imports can satisfy demand for twist-off closures until demand exceeds 100 million units per year, the approximate size of an economically-sized line. This transition is projected not to occur before the year 2001. Uncertain future demand for pry-off closures could discourage investment to upgrade existing lines.

Existing manufacturing capacity is sufficient to meet future processor demands for bottle closures. Competition from imports could necessitate investment by the Yangiyul plant to improve quality.

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[3] Forecasts based largely on projections received from commodity associations.

[4] Steering committee members were not in agreement about these figures. Given high costs connected to importing bottles, these international standards for minimum economically-sized plants could be down-scaled for Uzbekistan.

[5] Uzplodovoxchvinprom projects that bulk tomato concentrate packaging will move from large cans to aseptic plastic bags. Glass, not steel cans, is employed for most consumer pack cannery goods.

A multinational company could prompt the development of aluminium can manufacture and filling in Uzbekistan. This involvement could depend on regional demand (including neighbouring countries) of greater than 1 billion filled cans per year. The minimum economically-sized plant would have a capacity to manufacture and fill 700 million aluminium cans per year. At roughly 175 million cans, current consumer demand in Uzbekistan alone could be too low to justify this kind investment.

Growing processor demand for aluminium and tray foil products is projected to encourage investments in equipment to convert aluminium rolls into various products. Costs of converting operations can be relatively small (under US$ 1.5 million).

A number of conditions would have to be met before the private sector would consider investment in new pulping and papermaking equipment. An economically-sized plant would have a capacity in the range of 600,000 tonnes of pulp per year. Demand (i.e., sales) would be the first consideration. Current demand for food and drink packaging products is 40,000 tonnes per year. Demand in the year 2011, on the other hand, could exceed 800,000 tonnes. As much as 60% of this projected demand could come from corrugated board manufacturers; this demand is contingent on substantial investment in 10-15 corrugating lines. Potential investors will also look at recycling infrastructure. Given the international trend of using more recycled paper and board materials, recycled materials could provide up to 60% of all raw materials for papermaking in Uzbekistan.

Given higher projected demand for the year 2011, the paper and board industry could support a number of investments. Corrugated board manufacturing lines have already been mentioned: an economically-sized line has a capacity of 30,000 tonnes per year. In addition, investment into a paper coating could become attractive if demand for coated products exceeds 150,000 tonnes. Demand for coated products would develop through smaller investments in converting (box-making, printing) and wholesaling.

A significant development in the plastics sector revolves around plans to build a polyethylene (PE) production unit as part of an oil refinery project. It is planned that PE production will expand in line with increasing demand and that other plastic raw materials will also be produced at a later stage. Given substantial demand from the automobile and other non-food industries, proposed PE production could represent as little as 25% of overall plastics requirements for food and drink packaging[6]. Hence, the plastics converting industry is projected to continue to grow based on imported raw materials and to benefit from domestic supply of PE products in the future. In terms of food and drink packaging in Uzbekistan, investment in converting plastics has focused on polytetraphalate (PET). Current processor demand for other plastics is negligible. Given international trends, processor demand for these plastics, and corresponding converting industries, could grow exponentially.

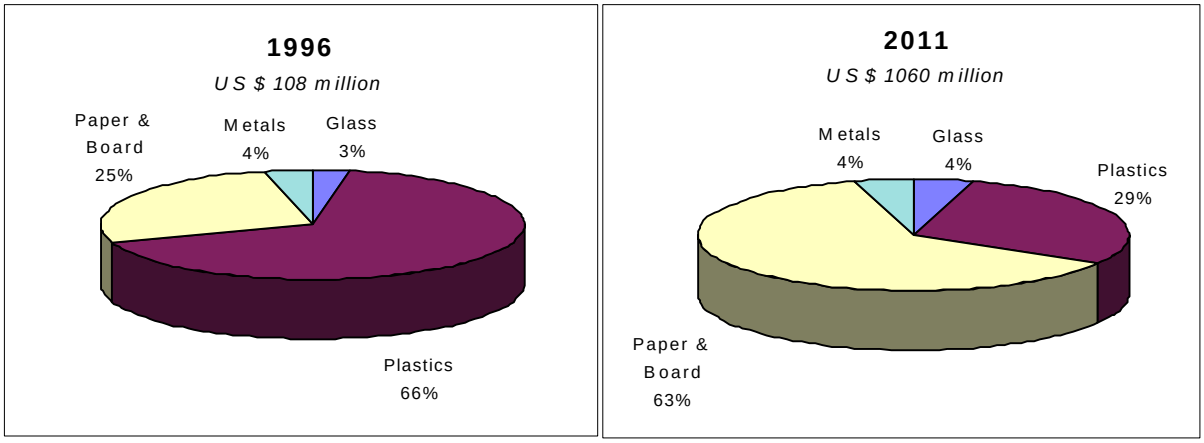
5.0 Foreign currency expenditure

The shift in supply and demand for food and drink packaging products has significant implications for the Uzbek government. Foreign currency requirements are one example. The research team estimated that foreign currency expenditure on imported food and drink packaging (raw materials and packaging products only) will increase from the

[6] Source: FAPU projections based on planned PE production, projected automobile manufacture requirements, and international trends.

current US$ 108 million to US$ 1,060 million in the year 2011 (see Annex C)[7]. The following pie charts (see Figure 1) demonstrate a possible shift in foreign currency expenditure:

Figure 1. Foreign Currency Expenditure on Food and Drink Packaging



The increase of foreign currency expenditure on paper and board products (mainly bulk paper rolls) is potentially enormous. This points to the need for government to encourage investment in modern papermaking equipment to reduce foreign currency expenditure on imported pulp and paper. Recent technology advances have yielded re-pulping and papermaking equipment which can produce quality paper for corrugated board manufacture from recycled materials. Corrugated board represents 40% of foreign currency expenditure on paper and board products.

92% of current foreign expenditure on plastics goes toward raw polytetraphalate (PET) purchases. This assumes demand for raw PET from the new Samarkand bottle forming and filling plant, which is near completion (as of 11/96). As a percentage of the whole, foreign currency expenditure on plastics could drop from 67% in 1996 to 29% in 2011. This is partly related to the development of polyethylene production in Uzbekistan. But, at US$ 310 million in 2011, plastic import requirements still represent substantial foreign currency expenditure. However, in terms of foreign currency expenditure, the per unit cost of glass and plastic containers are roughly the same: plastic containers are 20-30 times lighter than glass, and the per tonne foreign currency cost of plastic is 30 times greater.

6.0 Waste management

Food and drink packaging changes also have important implications for waste management. Annex D presents volume and cost analysis for waste management as it pertains to current and projected use of food and drink packaging.

Waste generated from food and drink packaging is projected to increase 5-fold in volume and 12-fold in cost over the next 15 years. Paper and board products are potentially the

[7] The research team estimated foreign currency expenditure on packaging products by taking processor demand figures for each packaging group (see Annex B). Corresponding supply to accommodate this demand was broken down between imported and domestically-manufactured packaging products, and foreign currency costs estimated for each. Estimates did not include imports of filled food and drink products.

fastest growing and the largest contributor to refuse levels: paper and board refuse is projected to grow 16-fold, representing 48% of food and drink packaging refuse in 2011. Plastics packaging could increase by as much as 8 times, representing up to 30% of food and drink packaging refuse in 2011. Glass and metal packaging refuse is projected to grow 2-fold and 4-fold, respectively.

The obvious factor in refuse management is recycling. Some international examples are presented in Table 1:

Table 1. International Examples for Recycling

Packaging Product	International Examples	Uzbek Situation
Glass Containers	Recycling (% of total disposal) 73% Netherlands 20% Greece Re-use declining	Re-use 85% bottles 20% jars
Paper and Board	Waste as % of raw materials for paper manufacture 62% UK Waste as % of raw materials for corrugated case manufacture 78% France 73% Germany 58% UK	Rough estimates of current recycling rates (% of total disposal) **/1**: 10% packing paper 20% packing board 40% corrugated board
Metals	No re-use. Aluminium recycling percentages: 50% International average 20% UK	No recycling
Plastics	Small amount of recycling for black film and road surfacing.	None

1 *Source: Uzbek Furniture Association*

In Europe and the US, the approach of government is reduce landfill disposal by collecting refuse and encouraging the private sector to recycle and incinerate according to energy recovery approved restrictions. Energy recovery approved incineration demands heat or power generation, and is much more restrictive than simple open burning. At the retail level, the private sector has become profitably involved in collection and recycling, especially of paper and board products. At the consumer level, local government has been more or less successful at encouraging consumers to separate refuse; once separated, the private sector is often capable of profitable collection and recycling.

In the UK, for example, the government has formed an agreement with all branches of the packaging industry which stipulates that 50% of all UK packaging will be either recycled or incinerated (with energy recovery restrictions) by the year 2001. The recycling or incineration targets for the different packaging sectors are 53% for paper and board, 57%

for glass, 37% for steel, 52% for aluminium and 15% for plastics. Moreover, a landfill tax has been increased from a small amount to the equivalent of US $ 11 per tonne.

In terms of refuse disposal costs, sensitivity analysis for Uzbekistan (see table below) indicates:

- a substantial return from investment in recycling improvements and;
- a small return from encouraging the use of less plastic and more glass containers.

Investment to expand the existing recycling (re-use) programmes by 20% could generate a hypothetical annual return of US$ 400,000 in 1996, and, given higher refuse levels projected for 2011, this annual return could increase to US$ 3.5 million by the year 2011.

Table 2. Waste disposal requirements: sensitivity analysis

Figures in USD cost of disposal

	Base Case		Scenario 1 Increase Recycling of Glass, Paper and Metals by 20%		Scenario 2 Increase glass use by 20% Decrease plastics use by 20%	
Packaging Type	1996	2011	1996*	2011	1996*	2011
Glass	859,914	3,786,415	494,129	2,019,421	1,031,897	4,543,697
% of Annual Total	47%	19%	34%	12%	55%	23%
Plastics	600,300	6,063,082	600,300	6,063,082	480,240	4,850,466
% of Annual Total	33%	30%	42%	37%	25%	25%
Paper & Board	289,800	9,716,802	267,360	8,046,118	289,800	9,716,802
% of Annual Total	16%	48%	19%	48%	15%	50%
Metals	82,101	499,463	82,101	477,794	82,101	499,463
% of Annual Total	4%	2%	6%	3%	4%	3%
Totals	100%	100%	100%	100%	100%	100%
USD	**1,832,115**	**20,065,762**	**1,443,890**	**16,606,415**	**1,884,038**	**19,610,428**

* *1996 estimates are only listed to demonstrate how disposal costs would change in the unrealistic event that scenarios were implemently immediately.*

7.0 Conclusions

The financial health of the food and beverage processing sector, including investment in new filling equipment to accommodate new packaging products, is evidently the key component to investment into and the financial status of packaging manufacturing industry. Former state processing enterprises, which account for a large percentage of packaging product purchases, have benefited from recent privatisation steps but enterprise management is still constrained on a number of important fronts. Given these constraints, the response of these processing enterprises to the availability of improved packaging, in terms of packaging product purchases and processed food sales, could be weak.

The research team projected steady growth for glass and steel packaging products, and exponential growth for aluminium, plastics, paper (see Annex B).

The table 3 summarises the current and projected numbers regarding demand, supply and shortfall of packaging products:

Table 3. Packaging product: Supply and Demand

Packaging Type		Units	1996 Processor Demand	1996 Current Capacity	1996 Shortfall	2011 (projected) Processor Demand	2011 Current Capacity	2011 Shortfall
Glass	bottles	million units	45	90	-	1,020	** 90	930
	jars	million units	150	240	-	350	** 240	110
Paper	packing paper	tonnes	10,000	100,000	-	126,000	100,000	26,000
	board	tonnes	12,000	small	12,000	252,000	small	252,000
	corrugated board	tonnes	17,000	100,000	-	468,000	100,000	368,000
Steel	closures for bottles	million units	50	1,200	-	530	1,200	-
	closures for jars	million units	158	100	58	665	100	565
	food cans	million units	30	100	-	6	** 100	-
Aluminium	cans	tonnes	-	none	-	**1/**	none	**1/**
	other	tonnes	232	none	232	9,618	none	9,618
Plastics (conversion)		tonnes	26,250	28,000		200,000	28,000	172,000

1/ *Investment is contingent on supplying the entire central Asian region*

** *Part or all of manufacturing capacity is obsolete and will need to be replaced.*

Current suppliers of glass, paper and board, and lacquered steel plate in Uzbekistan benefit from a monopoly position and, in some cases, from the inability of processors to import competitive packaging products. Competition in the short-run does not necessarily equate to new plant and equipment in Uzbekistan. In cases where current demand might not justify immediate investment, such as glass jars and steel closures and cans, another option for competition is to allow imports until increased processor demand justifies more investment in packaging product manufacture. A summary of investment concerns by packaging product group: (See Table 4)

Table 4. Summary of investment issues

Packaging Product Group	Investment Issues
Glass jar manufacture	Current demand uncertain. Twist-off demand will develop only slowly. Economically-sized plant in the range of 200 million units per annum.
Glass bottle manufacture	Current demand for wine and ordinary bottles uncertain. Potential demand for sparkling wine bottles is strong and could interest investor. Investment in sand enriching in Uzbekistan also required. Economically-sized plant in the range of 200 million units per annum.
Paper and board	Present pulping and papermaking capacity underutilised. Investment is premature.
Corrugated board forming	Current demand is poor. Steady investment in corrugated board manufacturing plants could develop after demand increases.
Steel bottle closures	Existing manufacturing capacity sufficient to meet current and future demands.
Steel jar closures	Uncertain future demand for pry-off lids will discourage upgrading of existing lines. Imports can satisfy demand for twist-off closures until demand exceeds 100 million units per year - the size of an economically-sized plant.
Food cans	Projected dwindling processor demand for food cans could serve to discourage investment in can manufacturing.
Aluminium converting	Fragmented demand and smaller investments to develop exponentially.
Aluminium can manufacture and filling	Investment could follow regional demand of greater than 1 billion units per annum. Current demand in Uzbekistan could be as low as 175 million units.
Plastics converting	Fragmented demand and smaller investments to develop exponentially.

The increase of foreign currency expenditure on paper and board products is potentially enormous. Recent technology advances have yielded re-pulping and papermaking equipment which can produce quality paper for corrugated board manufacture from recycled materials.

Waste generated from food and drink packaging is projected to increase 5-fold in volume and 12-fold in cost over the next 15 years. Paper and board products are potentially the fastest growing and the largest contributor to refuse levels.

8.0 Policy recommendations

The government needs to take further steps to improve the business environment for processors, especially former state enterprises. Investments in packaging manufacturing before these steps are taken could prove unprofitable: reasonable returns on investment are contingent on a healthy processing sector. Some possible steps:

- continue liberalising prices for raw and final products;
- move more quickly toward international banking standards, especially in terms of removing restrictions on salary levels and on the use of cash; and,
- improve the capability of processing enterprises to import packaging products and equipment, and to export final products.

Moreover, the government should consider steps to improve the business environment for packaging manufacturers. Manufacturers would certainly benefit from a reduction in high export duties to generate export sales (to help fill underutilised capacity), and independent foreign currency access.

One route to improve the supply of good quality packaging products is to improve the availability of foreign currency to processors for importing packaging products. This would help processors and also provide competitive incentives for domestic packaging manufacturers to lower costs, improve quality, and regain market share. Moreover, export-oriented sectors, such as wine and tomato concentrate, could generate more foreign currency earnings with final product exports. The government should consider improved access for:

- food and drink processors to import packaging imports;
- processors to import filling equipment;
- importing various raw materials for packaging manufacture, including steel plate for cans and closures, pulp and paper, and raw materials for improved glass manufacture;
- importing various plastic raw materials in the short-run, especially polyethylene products.

The most attractive government investment is in the expansion of existing infrastructure to improve paper and board recycling. The benefits from this investment are numerous:

- lower disposal costs;
- increase supplies of recycled materials to fill re-pulping capacity at the existing Angren plant;
- build supply of recycled materials toward future investment in modern re-pulping and specialised paper-making equipment;
- lower demand for foreign currency expenditure on imported paper and pulp; and,
- improve the environment by less landfill and incineration.

Other recycling programmes, especially for steel, aluminium and glass should be considered at the same time. It is likely that glass recycling, as compared to present re-use, will increase substantially over the next 10-15 years. Private sector involvement should be incorporated into recycling programmes wherever possible.

Other government investments in the packaging industry could be premature. With the possible exception of bottles for sparkling wine, financial returns from investment in new

paper or glass manufacturing plants are uncertain: current demand does not appear to justify investment. When demand builds to a level where a financial return can be achieved, private sector incentives should be considered instead of direct government investment.

Despite insufficient demand in Uzbekistan, there might be foreign companies willing to invest now to secure position, to develop manufacturing alongside new processing capacity, or to take advantage of regional markets. One possible approach to interest international glass or paper manufacturers:

- initiate tender procedure for the license to produce glass or paper in Uzbekistan;
- consider solidifying existing and additional investor incentives, such as low tax regimes for early years, no or few import/export duties, and currency conversion entitlements; and,
- once foreign company involvement is secured, consider full privatisation of existing plants, including identifying private sector financing for equipment upgrades.

The government should consider further steps to increase managerial and financial independence of packaging manufacturing plants. This will enhance opportunities for private sector financing for new plant and equipment.

A recycling strategy should be developed to cover the next 15-20 years, including targets for major refuse categories. The Furniture Association is eager to improve collection efforts for paper and board refuse generated at consumer and retailer levels. The Angren plant is willing to buy recycled paper and board materials from private or public sector suppliers. The government should support these efforts and consider direct investment, especially for consumer generated refuse. Private sector involvement should be considered at all levels.