

Session 1.3

Role of Transport Services to Support Agriculture

- 1 Marketing Chains
- 2 The First Mile
- 3 Impassability & Rough Roads
- 4 Extension & Credit
- 5 Efficiency of Transport & Marketing System
- 6 Introducing IMTs
- 7 New Markets and Modern Logistics

RURAL TRANSPORT AND AGRICULTURE

To properly understand the role Transport Services in supporting agriculture they need to be considered as an integral part of the whole distribution system. The overall efficiency of agriculture is affected by:

- The nature of the marketing chain
- Poor quality roads that are rough and seasonally impassable
- Access to farm inputs, extension advice and credit
- Monopolistic practises in both marketing and transport
- Economies of scale
- Availability and choice of the means of transport
- The development of modern supply chain management

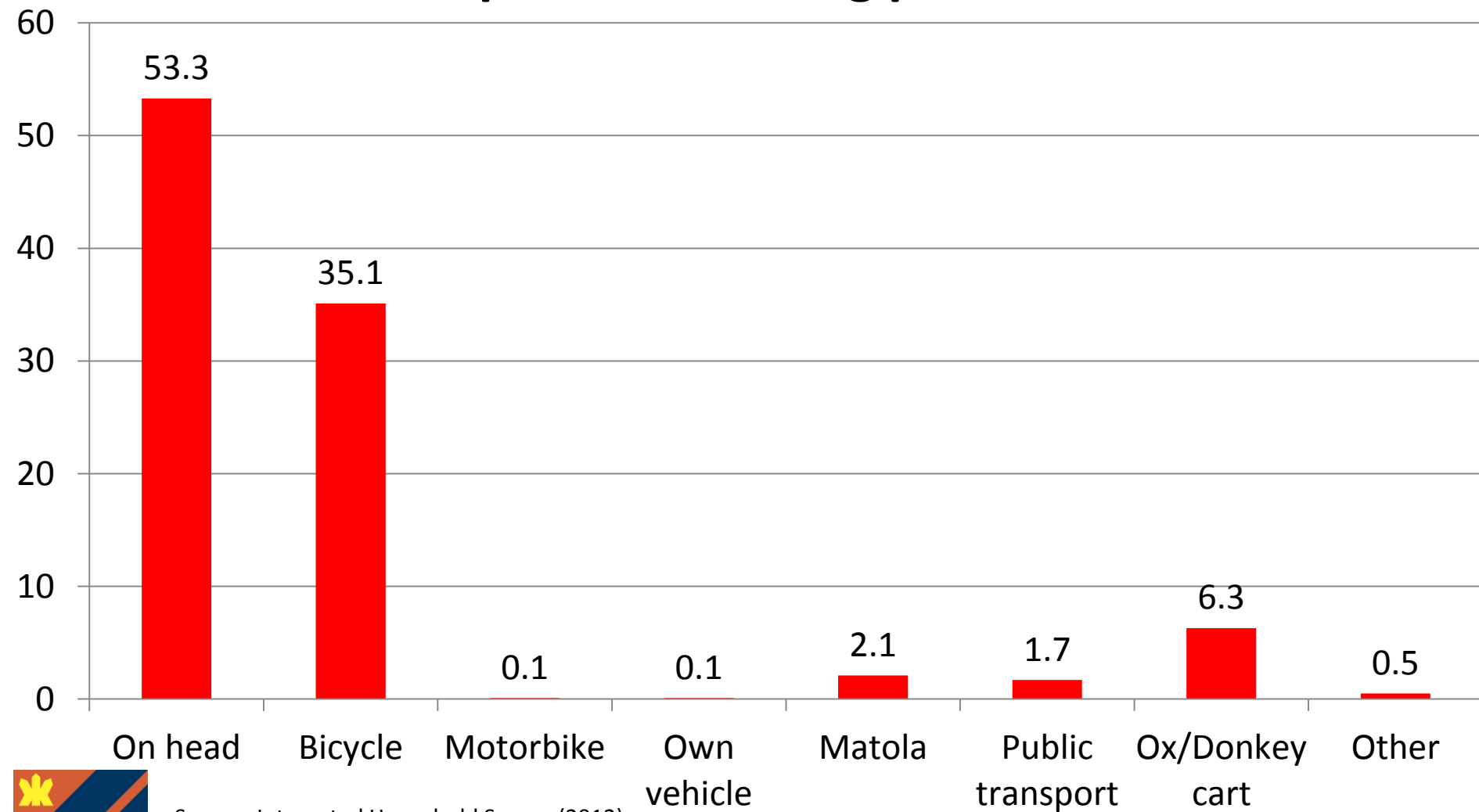
Traditional agricultural marketing involves a number of stages of movement, storage and intermediaries. Distribution costs include, transport, storage, wholesaler, and retailer expenses as well as spoilage costs.

	Typical Distance	Mode	Storage	Agents
Farm to village	1 -5 km	Headload, bicycle	Yes	farmer
Village to town	20- 300 km	Medium Truck, Tractor & trailer	Yes	Travelling wholesaler (or trader)
Within town	0.5 - 5 km	Hand trolley, small truck	Yes	Urban wholesaler, retailer

TRANSPORT OVER THE FIRST MILE (OR MILES!)

- The first stage of crop movement, from field to roadside, house, village, or to the local market is the most expensive. Terrain can be difficult, load sizes are small and there may not be a motorable road. This first stage of movement can represent a major constraint to the development of agriculture.
- In Africa head loading is a key form of transport for this movement. Yet per ton-mile it is very expensive - in the order of 10 to 30 times more expensive (if hired labour is used) than by truck. It is very time consuming and can give medical problems to those involved.
- If difficult pathways can be improved or converted to a track or road then IMTs such as bicycles, motorcycles, animal carts or tractors and other forms of motorised transport can be used.

Percentage distribution of villages by how produce was transported to selling point in Malawi



Source: Integrated Household Survey (2012)

THE EFFECTS OF TEMPORARY AND SEASONAL IMPASSABILITY

During the wet season many unpaved roads become impassable or very hard going, so transport costs rise, and this can have an effect on agriculture.

- Farm inputs – particularly the distribution of fertiliser- can be seriously affected by wet season accessibility because of the need to have them in place in time for the next growing season.
- Crops and products that are harvested through the year such as vegetables, tea and milk, and deteriorate easily once collected, can suffer serious losses if they are delayed in getting to the market or processing factory.
- Grain crops (generally harvested in the dry season) and tubers tend to be less affected by seasonal factors as they are easy to store.



- Many fruit crops (mangoes, bananas, tomatoes) can be seriously damaged by bruising when travelling on rough roads.
- It is possible to protect fruit by using packing materials, however these can be expensive and may transmit diseases if reused, - but packing is used in modern supply chains.
- Road quality in plantations tends to be particularly good for this reason.
- To minimise the effects of poor roads special vehicles are sometimes employed, for example to let bunches of bananas hang without rubbing against one another

TRANSPORT AND ACCESS TO EXTENSION AND CREDIT

- It is often reported that remotely located farmers are at a disadvantage in accessing extension advice and credit.
- This was particularly noted in a study by TRL of Ashanti Region of Ghana for accessing credit for farming.
- The reason behind the problem was the need for multiple trips to be made between village and the extension service. The farmer needed to travel to see the extension officer. He then arranged to have the farm measured (more transport) and approved for the loan. Once approved the farmer needed to collect the loan, and lastly arrangements needed to be made to pay back the loan.
- Extension workers themselves may have their own vehicle, or motorbike –or may use public transport.
- Clearly farmers would be at a disadvantage if the journey to town was long, expensive and unreliable.

THE EFFICIENCY OF TRANSPORT & MARKETING SYSTEMS 1

The Transport and Marketing Systems in many developing countries are expensive and inefficient. Because:

- Density of demand is low so volumes are low.
- They are often monopolistic and controlled by associations. In Ghana agricultural markets are controlled by different commodity seller associations. While the Ghana Private Road Transport Union (GPRTU) controls transport services.
- Studies (e.g. by Charles Gore in Ghana) have shown how market associations keep prices high by both enforcing retail price control and restricting the supply of particular commodities into certain markets – including fining truck drivers.
- Because of the way that the supply of both commodities and transport services are controlled the distribution system is expensive and unresponsive.

THE EFFICIENCY OF TRANSPORT & MARKETING SYSTEMS 2

- Travelling wholesalers (traders) control prices offered to farmers. They often travel together to a village and are able to prevent competition through allocating farmers to different wholesalers, the relationship is reinforced through credit relationship.
- Farmers can improve the prices they get by selling directly in the urban markets (often directly at the bus station). However this can be very expensive. They have to pay their fare to-and-from the market and often pay a very high price for their small volume of produce (the tariff for a small bag of maize will be much higher than a passenger fare) . They will also lose a day's time and market authorities harass them in the process.
- Often because of inefficient private marketing systems Government Marketing Boards have been introduced in many countries, however there has been pressure to reduce their role over the last 20 years. The role of ADMARC in Malawi is discussed in session 1.4.

OTHER FACTORS HINDERING EFFICIENCY

- Farmers often have little choice over who they sell their produce to: small volumes in remote locations do not promote competition
- Indebtedness may force farmers to sell at the peak harvest time when prices are low. Similarly if the farmer is in debt to the wholesaler it may prevent him from selling to anyone else.
- Relevant market price information may also be difficult to obtain in remote rural areas. - However this may now be changing with the widespread use of mobile phones.
- There is often reported to be an inadequate supply of tractors and transport vehicles at peak harvest time.

Example of Inefficient Markets: Commodity Prices & Transport Costs for Different markets in Ashanti Region of Ghana

	Max price cedis	Min price cedis	Dist km between min and max price markets	Calculated marginal increase in transport charges of moving produce between markets	Transport charge as % of difference in market prices
Maize, 100 kg bag	120	56	87	3.61	5.6
Plantain 10 kg bunch	18.6	7	73	0.49	4.2
Yam 100 tubers	447	316	89	20	15.3

Examples of Farm Gate Prices on Southern & Western Corridors of Tanzania

Road Section	Location of Data Collection	Sunflower	Maize Price	Ground nuts	Irish Potatoes	Beans	Onions	Tomatoes	Simsim	Paddy	Finger Millet
Mikumi - Mafinga	Mikumi		224	933	308	1,105	694	363	1,000	885	600
	Ilula	321	330			920	950	166			
	Tanangozi	235	345		313	880	650	127			
	Mafinga		294	1,061	293	878	579	220		1,000	556
Tunduma - Sumbawanga	Tunduma		307		300	744		421		1,013	
	Laela	115	226	164		600		150			101
	Sumbawanga	413	359			582	544	306		633	
Sumbawanga - Mpanda	Chala	330	292		333	516	1,429	371			1,250
	Mpanda		366			975	556	333		722	300
Ntendo - Muze	Ntendo	279	305	375		757	1,000	306			425
	Muze	377	337						1,189	567	667
	Sumbawanga	413	359			582	544	306		633	
Kibaoni - Igalukilo	Kibaoni	502	280	343		750			1,048	1,227	
	Igalukilo	333	278	486		725				414	

What difference has the mobile phone made to commodity marketing in your country?

- Transport costs in Africa (analysed in detail in Session 3.2) are believed to be in the region of three to six times as high as those in Asia and as result have a serious knock-on effect on the prices farmers receive for their crops
- It is estimated that **African** farmers receive in the region of 30-50% of final retail prices compared to 70-85% received by **Asian** farmers, However, the proportion varies from crop to crop and location to location
- Commodities with low value-to-weight ratios such as sugar cane or coconuts are very sensitive to transport costs and cannot be transported far. For sugar cane it is usually necessary taken to a factory within 5 to 10 km of the farm. In contrast high value crops like cocoa or vanilla can bear the costs travel over long distances

INTRODUCING IMTs

IMTs can be extremely useful in transporting goods –the first mile - (from field to village) or to the local market.

They can help to:

- Increase capacity
- Increase speed
- Reduce transport costs
- Provide new economic opportunities
- enable farmers to sell their produce when - *road conditions are bad, motor vehicles rare, producer prices high*



The Use of IMTs :

Will enable farmers to reach distant markets, increase demand for new products and help reduce the cost of inputs. Typical distance ranges are:

- 3 - 4 hours of walking (one way 10 - 15 km) = threshold for access to markets
- pack animal - 20 km in hilly areas
- a bicycle - 30 km in flat terrain
- single-axle tractor with trailer - 50 km

Transport costs for evacuation of the annual yield of 1 Hectare

Transport cost \$/ha						
	Yield kg/ha	Walking	Animal cart	Cycle trailer	Hand cart	Ox cart
Cocoa	900	7	3	2	2	1
Rice	1500	12	5	3	3	2
Maize	1900	15	6	4	3	2
Cocoyam	7000	54	22	16	12	7
Yams	8000	62	25	18	14	8
Plantain	9000	69	28	20	16	9
Oil palm	10000	77	31	23	18	10
Cassava	10000	77	31	23	18	10

Assumption: distance field to collection point = 5 km

TRANSPORT AND THE DEVELOPMENT OF NEW MARKETS AND SUPPLY CHAIN MANAGEMENT*

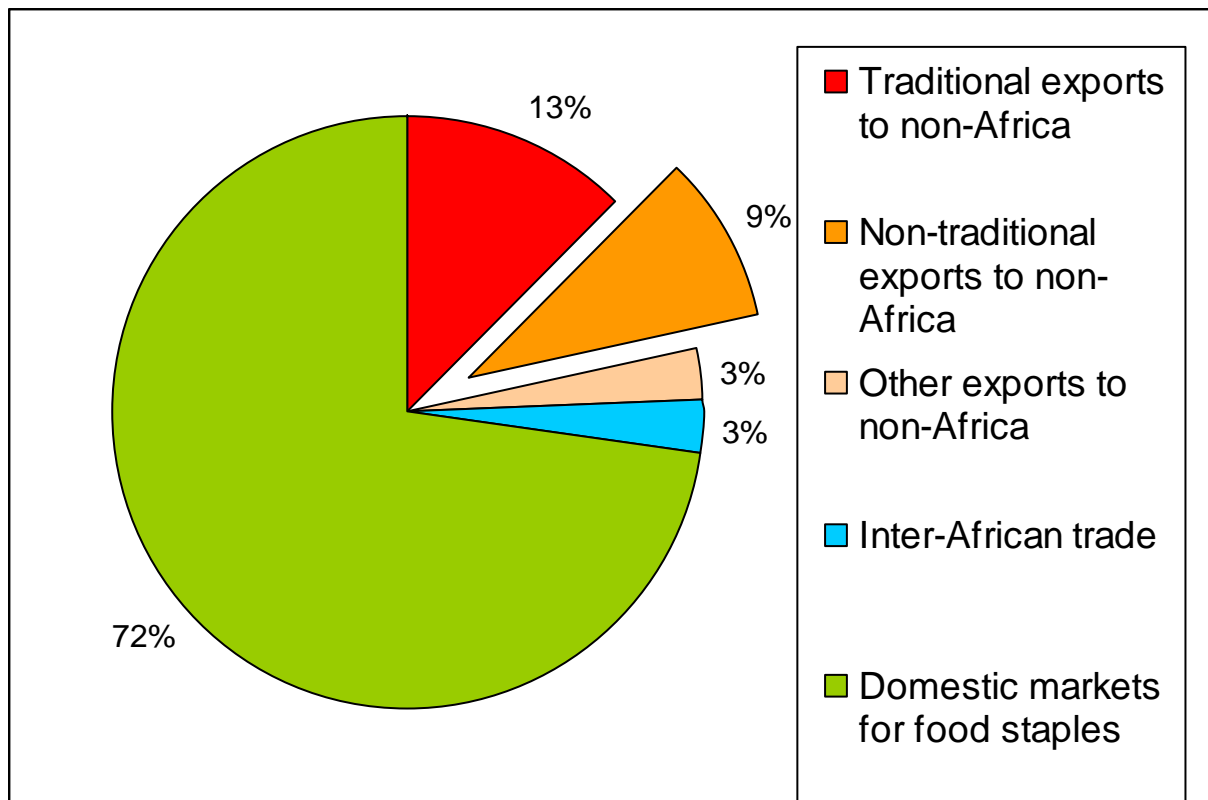
Developing countries are responding to new markets in supplying high value products to foreign markets such as fruit, vegetables, fish and flowers. These require modern supply chain management, involving quality control, cold storage, careful packing, and timely transport to meet specific flight schedules.

Supermarkets like to work with medium and large scale farmers, however, in Kenya 75% of fruit and vegetables come from small farmers.

* This section draws on the Work of Niklas Sieber –Leapfrogging from Rural Hubs to New Markets

Meeting New Export Markets

Share of agricultural value marketed in SSAfrica 1996-2006



Source: Staatz/ Dembélé 2007, p.44

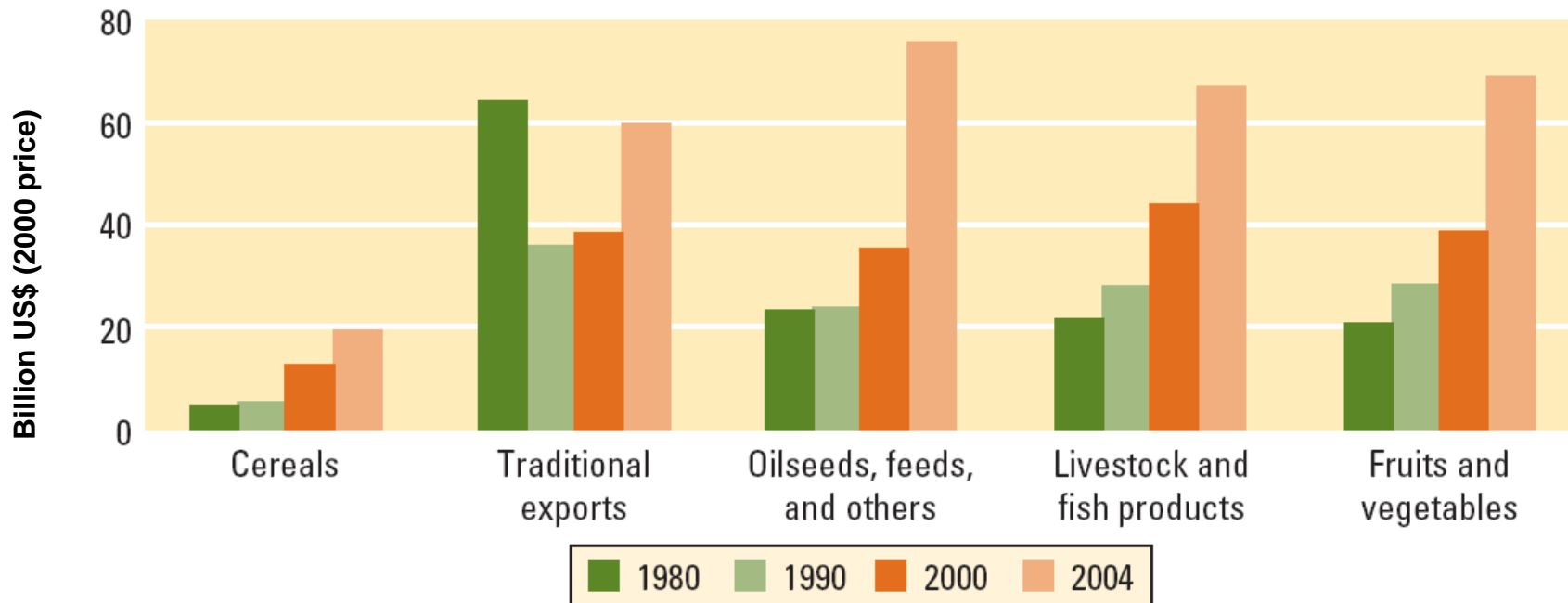
Traditional Exports:

Cotton lint, Molasses, Chick peas, Beans, dry, Bran of Wheat, Cocoa beans, Sesame seed, Cashew nuts, with shell, Cake of Cottonseed, Maize, Palm oil, Tea, Sugar Raw Centrifugal, Cottonseed, Rubber Nat Dry, Jute, Coffee Husks and Skins, Rice Milled, Coffee, green, Onions, dry, Rice Broken, Tobacco, unprocessed



New high value products for export

Value agricultural exports from Developing Countries



Source: WDR 2008, p. 61

World Bank Project: Mangoes from Mali



Supply Chain from Sikasso to Europe:

- processing and packaging units,
- cold chains,
- multi-modal shipment system.

- Shipments of mangos from Sikasso:
220 tons in 2001
600 tons in 2002
1,000 tons in 2003
- Net profit: 44,600 US\$,
Internal Rate of Return: 70%.
- Grower unit prices progressed by 25%
- Employment in the pack houses:
150 persons of which more than 60%
women.
Adequate working conditions and pay
exceeding national labour benchmarks.
- Mango producers benefited from a
significant increase in their revenues.

Source: Danielou et al 2003

Requirements of new markets

- High value marketing requires
 - centralised procurement,
 - involving specialised wholesalers,
 - new contracts with suppliers and
 - quality and safety standards
 - “farm to fork” certification is the goal.
- Modern logistic services needed:
 - packaging, cold chain management, container handling, establishment of distribution centres and warehousing.



Quality Supply Chain Management

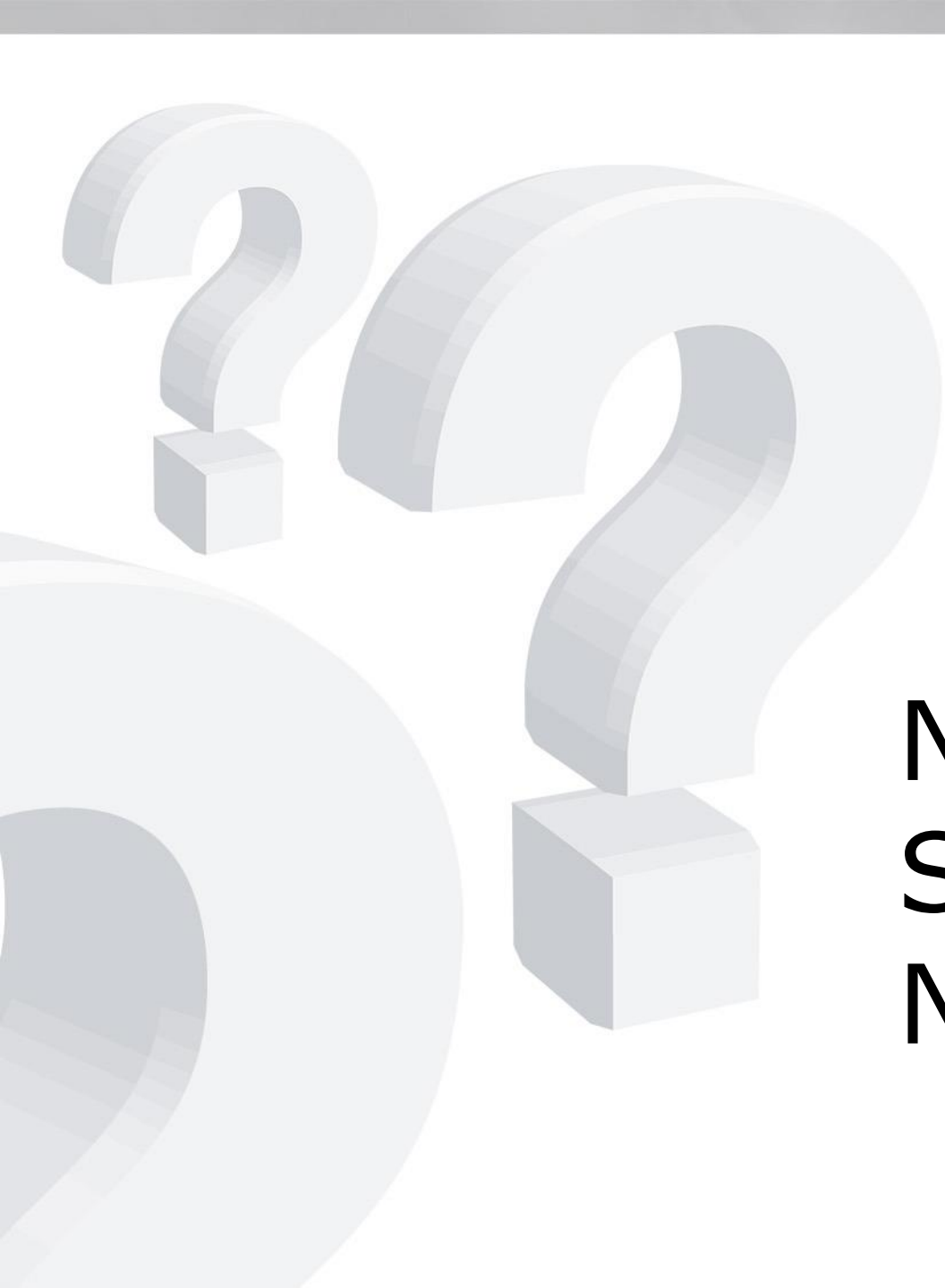


Distance and time to market are critical considerations in Supply Chain management.

- Fresh produce progressively deteriorates with increasing time between harvest and consumption.
- No private investments in Supply Chains will be undertaken, if frequent disruptions of the transport chain can be expected.
- All year Fresh produce must be properly protected during transportation in order to minimise mechanical damage, temperature abuse, taint and contamination by food-borne pathogens.

Logistics of Modern Supply Chains

Harvest	<ul style="list-style-type: none">• Minimise delays before cooling• Cool the product thoroughly as soon as possible
Cooling	<ul style="list-style-type: none">• Store the produce at optimum temperature
Temporary storage	<ul style="list-style-type: none">• Practice 'First in First out' rotation storage• Ship to market as soon as possible
Transport to market	<ul style="list-style-type: none">• Use refrigerated loading area• Cool truck before loading• Load pallets towards the centre of the truck• Put insulating plastic strips inside door of refrigerated truck if it is to make multiple stops• Avoid delays during transport• Monitor product temperature during transport
Handling at destination	<ul style="list-style-type: none">• Use a refrigerated unloading area• Measure produce temperature• Move produce quickly to the proper storage area• Transport to retail markets or foodservice operations in refrigerated trucks• Display at proper temperature range



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Session 1.3
Notes!