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From Record Harvests to Value-Added Food Processing

PAKISTAN'S PROCESSED POTATO PRODUCTS OPPORTUNITY

UNLOCKING GROWTH

SEASON 04

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REPORTED Published or officially reported figure

ESTIMATE Model, desk research or practitioner estimate

01

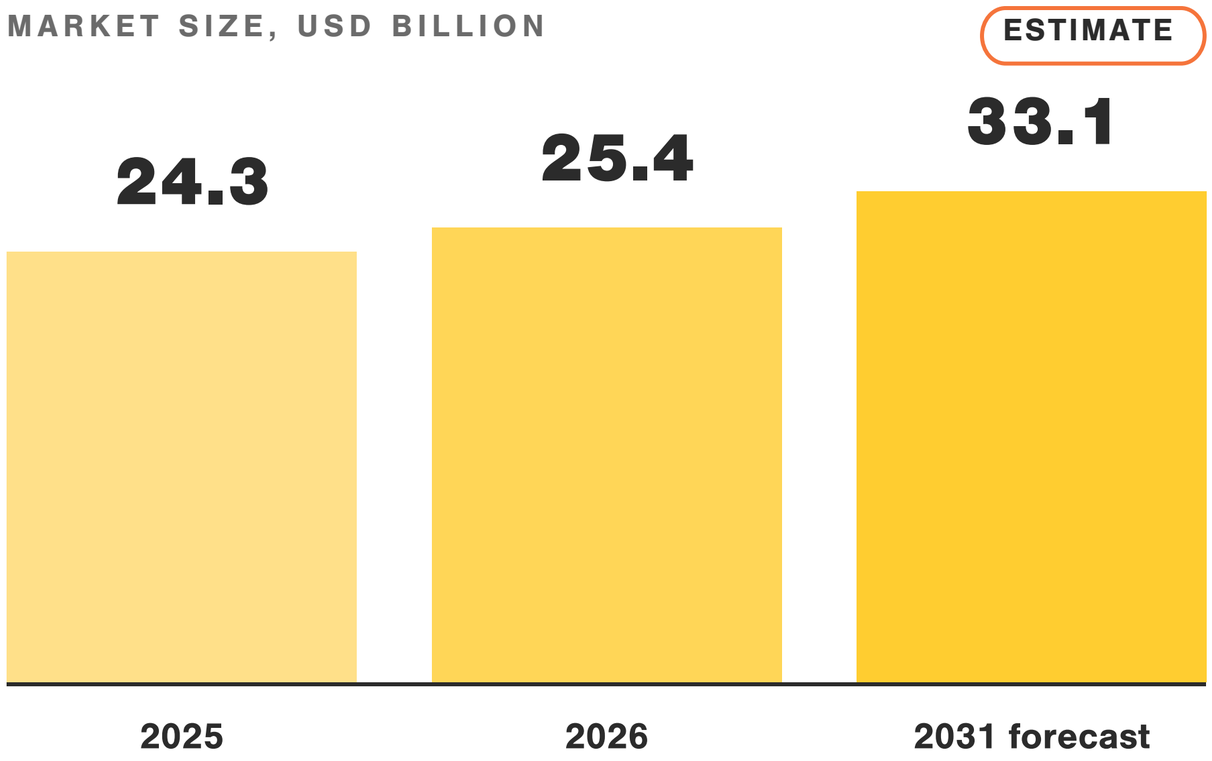
INTRODUCING THE OPPORTUNITY

The global French fries market, the wider processed-potato family, and how value rises at each stage

THE GLOBAL FRENCH FRIES MARKET

Frozen French fries are the most export-ready product in the processed-potato family. Restaurants and fast-food chains buy them in bulk, ready to finish frying.

MARKET SIZE, USD BILLION



~5.4%

Forecast growth per year, 2026–2031

~88%

Share of the fries market that is frozen

~USD 8B

Global trade in frozen fries, 2021. A trade figure, not market size

Source: Mordor Intelligence, French Fries Market (2026); Pakistan Business Council (PBC), Value-Added Processing of Potato in Pakistan (2023), pp.20–21.

NOT ALL PROCESSED POTATO PRODUCTS ARE THE SAME

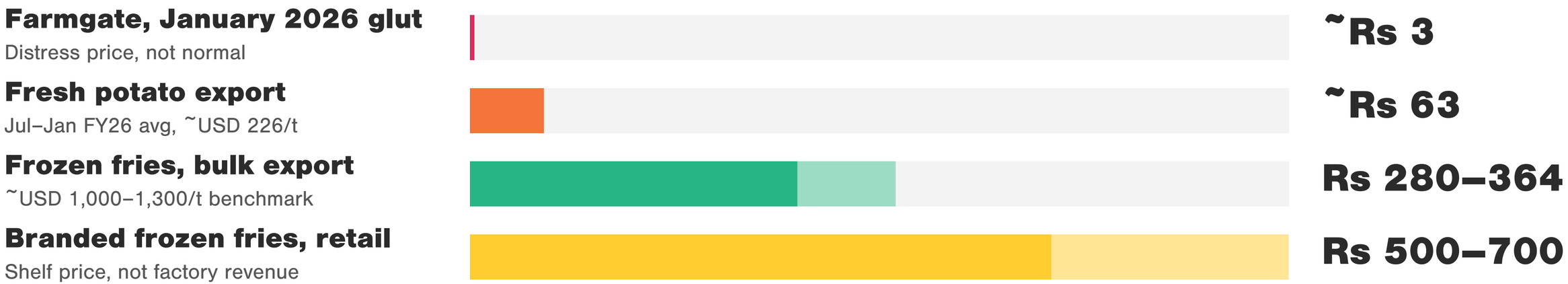
Each product has its own buyers, machinery and economics, so each needs its own business plan.

SEGMENT	TYPICAL BUYERS	PAKISTAN OPPORTUNITY
Frozen French fries	Fast-food chains, restaurants, caterers, frozen-food retailers	**Strongest case: domestic growth, with exports possible if conditions are met**
Potato crisps / chips	Shoppers buying branded packaged snacks	Established and dominated by a few brands; hard to export as a new brand
Potato starch	Food manufacturers, paper industry	Could replace imports; specialised process
Flakes / powder / flour	Food manufacturers, bakeries, industrial buyers	Niche uses; no proven near-term export case

Source: PBC (2023), Executive Summary, pp.2–3, and sections 3–6.

THE PRICE AND VALUE LADDER

The same kilogram of potato is worth more at every step from the field to the freezer aisle. Prices in rupees per kg.



The opportunity: converting the right potatoes into a consistent, storable product with buyers already identified. Growing more potatoes alone does not capture this value.

- Al-Fatah and Opa retail prices. Conversions at Rs 280/USD. Export prices are indicative benchmarks.

02

THE LOCAL PICTURE

A record harvest, where it grows, and the processors already operating in Pakistan

PAKISTAN TODAY

Pakistan is one of the world's top-ten potato producers (ninth in one 2024 ranking). Very little of the crop is processed.

POTATO HARVEST, MILLION TONNES

REPORTED



HOW MUCH OF THE ~12M-TONNE CROP IS PROCESSED



~2.9% ~350,000 tonnes a year go to processors (illustrative; operator estimate)

4–4.5M t — ESTIMATE

Expected 2025–26 surplus (PHDEC)

500–600K t — REPORTED

Typical fresh potato exports a year; varies widely

USD 56M — REPORTED

Fresh exports Jul–Jan FY26, ~248,000 tonnes

Source: APP / Wealth Pakistan; FreshPlaza; PHDEC; Fauji Fresh n Freeze reporting. Processing share compares different reference bases.

WHERE THE POTATOES ARE GROWN

Punjab grows the bulk of the crop. Gilgit-Baltistan and Sindh play different, smaller roles.

PUNJAB · MAIN BELT

Okara, Sahiwal, Kasur, Pakpattan, Multan, Khanewal, Vehari

Close to large growers, cold stores and processors

PUNJAB · SECONDARY

Chiniot, Jhang, Toba Tek Singh, Faisalabad

Growers plus access to logistics

NORTH

Gilgit-Baltistan

Off-season crop. Promising for multiplying seed, less so for a bulk fries factory

SINDH

Badin, Sanghar, Tando Allah Yar

Possible potential for fries varieties; feasibility not yet established

Source: PBC (2023), pp.13–14.

PAKISTAN'S DOMESTIC PROCESSING BASE

Pakistan has the raw material and some proven processors. What is missing is reliable, large-scale conversion into finished products.

Opa! and Panda Fries

Opa! (Fauji Fresh n Freeze) and Panda Fries already make frozen fries at scale in Pakistan.

PepsiCo (Lay's)

Shows the value of industrial potato varieties and long-term contract farming. Chips and fries need different potatoes.

Import substitution

Local capacity has already replaced imports once. Fries are an existing category, not a new one.

USD 11.3M

Fries imported in 2017, before local expansion

Source: PBC (2023), pp.5, 17–18, 24. Company positions are historical.

03

WHAT IS CHANGING? WHY NOW?

A price crash, a closed border, new seed research and a regional example next door

FIVE FORCES RESHAPING THE OPPORTUNITY

	FORCE	WHAT CHANGED	WHAT IT MEANS
01	**Record harvest, price crash**	~12M-tonne harvest in 2025–26; some farmgate prices collapsed	Stronger reason to process and absorb surpluses
02	**Fresh export disruption**	The Afghanistan border closed from October 2025, cutting off a key outlet	Shows the risk of relying on a few raw-export destinations
03	**A maturing local category**	Opa, Panda and others built local fries capacity after years of imports	Local business buyers and supply practices now exist
04	**Processing-grade seed research**	PRI Sahiwal announced four high-dry-matter potato lines in July 2026	A possible future input; not yet commercial seed supply
05	**Regional proof of concept**	India built contract-grown potatoes and modern fries factories	A nearby country already supplies regional restaurant and export markets

PBC (2023), pp.17–22, 39.

WHY INDIA MATTERS

India's fries industry was built by developing a supply chain: suitable varieties, contracted farmers and local factories. Buying machinery was only one part.

c.1988

McDonald's starts building its Indian supply chain. McCain later helps develop varieties, farmer ties and local factories

2008

30% of McDonald's India fries made locally

2010

75% made locally. Domestic producers such as HyFun Foods follow

~USD 250M

~234,000 tonnes of frozen fries exported in the 12 months to September 2025

INDUSTRY SERIES

Source: PBC (2023), p.39, citing Stanford GSB McDonald's India case; Indian Potato Sector 2025 Annual Report / IndianPotato.com (approximate currency conversion).

04

THE REAL BARRIERS & CERTIFIED SEED

Six constraints, the seed bottleneck, and what processing can and cannot fix

SIX CONSTRAINTS THAT DECIDE VIABILITY

BARRIER	WHAT IT MEANS	PRACTICAL RESPONSE
Wrong raw potatoes	Ordinary table potatoes are often too watery or fry too dark	Source tested, fries-specific varieties
Certified-seed access	Quality seed is expensive and formal supply is uneven	Contract seed multipliers; support and test farmers
Sugars from storage	Poor storage raises sugar levels, which darkens fries	Control storage; test stored batches
Energy and freezing	Par-frying, freezing and a reliable cold chain are costly	Plan power, backup and refrigeration before buying machines
Seasonal working capital	Most of the crop arrives in a few harvest months	Secure inventory finance and contracted supply
Market access and price	Buyers choose on specification, consistency, certification and price	Win repeat business buyers; check export specs and delivered costs

Source: PBC (2023), pp.7–11, 19–22

CERTIFIED SEED: THE MISSING LINK

Certified seed potatoes are planting material grown and inspected under a quality system, not potatoes bought from a mandi and replanted. A processor needs the right variety and a disease-managed seed supply.

WHAT MAKES A POTATO GOOD FOR FRIES

20–22%+
Dry matter: the solid part of the potato, which keeps fries crisp

Long shape
Elongated tubers cut into long, even strips

Low sugars
Less sugar means fries do not brown too much

Good colour
An even golden colour after frying

VARIETIES

Asterix, Santana	Certified varieties suited to fries, listed by PBC
Lady Rosetta	The main crisps variety; some fries makers use it because fries varieties are scarce
PRI Sahiwal lines	L 5-2, FD 74-30, FD 35-36, FD 74-50. Announced 2026; take-up not yet proven

Why it is a bottleneck: formal seed is costly and hard to get, reused seed spreads disease, and contract-growing arrangements are needed.

Source: PBC (2023), pp.7–11. A certified variety is not necessarily available at commercial scale.

GILGIT-BALTISTAN: AN UPSTREAM OPPORTUNITY

GB's cool climate suits multiplying seed potatoes. A local entrepreneur argues seed can pay better there than competing with Punjab on table potatoes.

SEED POTATOES, TONNES A YEAR

PRACTITIONER ESTIMATE



Domestic supply meets roughly one-fifteenth of estimated demand.

WHY GB

Cooler climate

Lower pressure from some potato diseases

Different calendar

Growing season complements Punjab's

Existing interest

PepsiCo and Jaffar Brothers reported doing seed work near Yasin

Source: Amjad Elia, Unlocking Growth interview (October 2026). First-person estimates, not independently verified national statistics.

PROCESSING AS AN ECONOMIC BUFFER

Frozen fries extend the shelf life of a perishable crop, but the process uses a lot of energy, water and oil. Only suitable potatoes make good fries, so a surplus is not the same as usable input.

AREA	OPPORTUNITY	TRADE-OFF
Farm income	Contract farming can give predictable sales and quality incentives	Contract terms, rejected crop and seed costs decide the real benefit
Post-harvest losses	Cold storage and processing preserve more value	Needs energy, refrigeration and loss management
Water and energy	Larger modern lines may use less per kg	Washing, blanching, frying and freezing are resource-heavy
Off-season supply	GB and managed seed systems can complement Punjab	Logistics, scale and suitability need checking
By-products	Peels, trims and offcuts may have other uses	Depends on hygiene, feed demand and scale

Source: PBC (2023), pp.13–15, 19–20, 41–43.

05

LOCAL & REGIONAL SUCCESS STORIES

The companies that built the market, a seed entrepreneur in Yasin Valley, and why business buyers come first

WHO HAS BUILT THE MARKET?

OPERATOR	WHAT THEY HAVE DONE	WHY IT MATTERS
Fauji Fresh n Freeze / Opa!	~68% historic domestic share; Rs 600M upgrade in 2021 added 3 tonnes/hour	Proves local production, cold chain, retail and business sales
Panda Fries	Planned expansion from 1,500 to 3,500 tonnes a year (2023)	A local player scaling up capacity
PepsiCo / Lay's	Industrial-grade potatoes and contract farming, for crisps	Shows the farming and seed system needed before scale
Smaller fries producers	Golden Brown, Grizzly Fries, Kings Fries, Frozen Hub	Processors exist beyond multinationals
India: McDonald's, McCain, HyFun	Adapted seed, contract growers, cold supply chains and anchor buyers	A regional route from raw crop to export processing

Source: PBC (2023), pp.17–18, 24, 39. Market shares and capacities are historical, not current.

IN FOCUS: AMJAD ELIA, YASIN VALLEY

An agriculture graduate building a certified seed potato business in Gilgit-Baltistan.

LOCATION	Yasin Valley, Ghizer, Gilgit-Baltistan
SECTOR	Agriculture, certified seed potato production
STARTING POINT	Returned home around 2020 with few local jobs in agriculture, and set out to build a business on the region's natural advantages
TRAINING	NARC–KOPIA programme in Islamabad on aeroponics: growing seed potatoes in air with misted nutrients, which limits soil disease
WHAT HE BUILT	Small-scale seed trials, a model farm, farmer field schools, and outreach through the Mountain Farmer Academy

- Source: Amjad Elia, Unlocking Growth interview (October 2026).

ANCHOR BUYERS MATTER MORE THAN BRANDS

Most fries worldwide are sold to restaurants, not shoppers. A new processor can start with repeat business buyers instead of an expensive consumer brand.

WHERE FRIES ARE SOLD, GLOBAL SHARE

HISTORICAL ESTIMATE



Quick-service restaurants (fast food)

Full-service restaurants

Retail

Source: PBC (2023), p.21. Older global estimates, not a verified current split for Pakistan.

06

BUSINESS MODELS & ECONOMICS

Set-up cost, running cost and unit economics for three frozen-fries plants, from 100 kg to 2,000 kg an hour

WHAT IS BEING MANUFACTURED?

All three tiers model frozen, par-fried French fries made by a food processor. Par-frying means partly cooking the fries, so the restaurant only finishes them. The models exclude takeaway carts, fresh-cut fries, crisps, seed and starch.



Blanch

Brief hot-water cook that sets texture and colour

Freeze

Large plants use IQF (individually quick frozen) tunnels so fries do not stick together

Store

Kept and shipped frozen, typically at −18°C or colder

Source: PBC (2023), pp.19–20.

DESK MODEL ESTIMATE

THREE PROCESSING TIERS COMPARED

	TIER 1 **Basic**	TIER 2 **Growth**	TIER 3 **Export plant**
Capacity, finished fries	~100 kg/hour	~500 kg/hour	~2,000 kg/hour
Customers	Local restaurants, caterers	Domestic business + retail; export trials	Large buyers, export
Operations	1×8h, 300 days, 60%	2×8h, 300 days, 60%	20h, 300 days, 70%
Annual output	~144 t	~1,440 t	~8,400 t
All-in start-up capital	**~Rs 3.5 crore**	**~Rs 13.3 crore**	**~Rs 63.5 crore**
Monthly running cost	~Rs 33 lakh	~Rs 2.7 crore	~Rs 13.5 crore
Cost vs price, per kg	Rs 273 → Rs 300	Rs 229 → Rs 340	Rs 193 → Rs 280
EBITDA margin	**~9%**	**~33%**	**~31%**

Rs 280/USD. Excludes land, financing and tax. EBITDA = earnings before interest, tax and depreciation.

DESK MODEL ESTIMATE

TIER 1 — START-UP COST, 100 KG/HOUR

A semi-manual line with entry-level freezing, supplying local restaurants and caterers. Best run alongside an existing distributor or cold store.

ITEM	USD	PKR
Processing and freezing equipment	$55,000	Rs 1.54 crore
Civil works	$16,500	Rs 46 lakh
Installation and commissioning	$6,900	Rs 19 lakh
Contingency	$11,800	Rs 33 lakh
Fixed CAPEX	**~$90,000**	**~Rs 2.5 crore**
Working capital (3 months of running costs)	—	~Rs 1.0 crore

TOTAL START-UP FUNDING

~Rs 3.5 crore

Excluding land

THIN MARGIN

~12,000 kg a month sells for ~Rs 3.6M against ~Rs 3.3M in costs, leaving ~Rs 0.32M EBITDA a month (Rs 3.9M a year)

Rs 280/USD; 8 hours/day, 300 days, 60% utilisation. Before financing and tax.

DESK MODEL ESTIMATE

TIER 2 — START-UP COST, 500 KG/HOUR

A semi-automatic line serving distributors, restaurant chains and packaged retail, with limited export trials once standards and cold chain are in place.

ITEM	USD	PKR
Processing and freezing equipment	$110,000	Rs 3.08 crore
Civil works	$33,000	Rs 92 lakh
Installation and commissioning	$13,800	Rs 39 lakh
Contingency	$23,500	Rs 66 lakh
Fixed CAPEX	**~$180,000**	**~Rs 5.0 crore**
Working capital provision	—	~Rs 8.2 crore

TOTAL START-UP FUNDING

~Rs 13.3 crore

Excluding land

INDICATIVE RETURN

~1,440 t a year at Rs 340/kg; ~Rs 160M EBITDA a year. Modelled payback ~3 years, very sensitive to potato cost, price and utilisation

Rs 280/USD; 2 shifts, 300 days, 60% utilisation. Monthly running cost ~Rs 27M. Not an investor return forecast.

DESK MODEL ESTIMATE

TIER 3 — START-UP COST, 2,000 KG/HOUR

A continuous line with an IQF freezing tunnel, export-grade packing and refrigeration, built for consistent large orders.

ITEM	USD	PKR
Processing, freezing and packing equipment	$500,000	Rs 14.0 crore
Civil works	$150,000	Rs 4.20 crore
Installation and commissioning	$62,500	Rs 1.75 crore
Contingency	$107,000	Rs 3.00 crore
Fixed CAPEX	**~$820,000**	**~Rs 22.9 crore**
Working capital provision	—	~Rs 40.6 crore

TOTAL START-UP FUNDING

~Rs 63.5 crore

Excluding land

NARROW CUSHION

~8,400 t a year at Rs 280/kg FOB (~USD 1,000/t); ~Rs 730M EBITDA a year. Buyers, certification, logistics and working capital are critical

Rs 280/USD; 20 hours/day, 300 days, 70% utilisation. Monthly running cost ~Rs 135M. FOB = price loaded at port.

DESK MODEL ESTIMATE

UNIT ECONOMICS PER KILOGRAM

RS PER KG	TIER 1	TIER 2	TIER 3
Potatoes	92	90	86
Cold storage	9	8	8
Frying oil	38	29	24
Energy	25	25	23
Packaging	17	16	16
Maintenance and consumables	17	16	16
Labour	**60**	18	8
Selling, admin, distribution	15	27	14
Total operating cost	**273**	**229**	**193**
Assumed selling price	300	340	280
EBITDA per kg	**27**	**111**	**87**

EBITDA-level estimates, not net profit.

Labour drives the gap

Tier 1 spends Rs 60/kg on labour, against Rs 8 in Tier 3

Scale has its own risks

Larger plants need steady demand and carry financing, energy and input-price risk

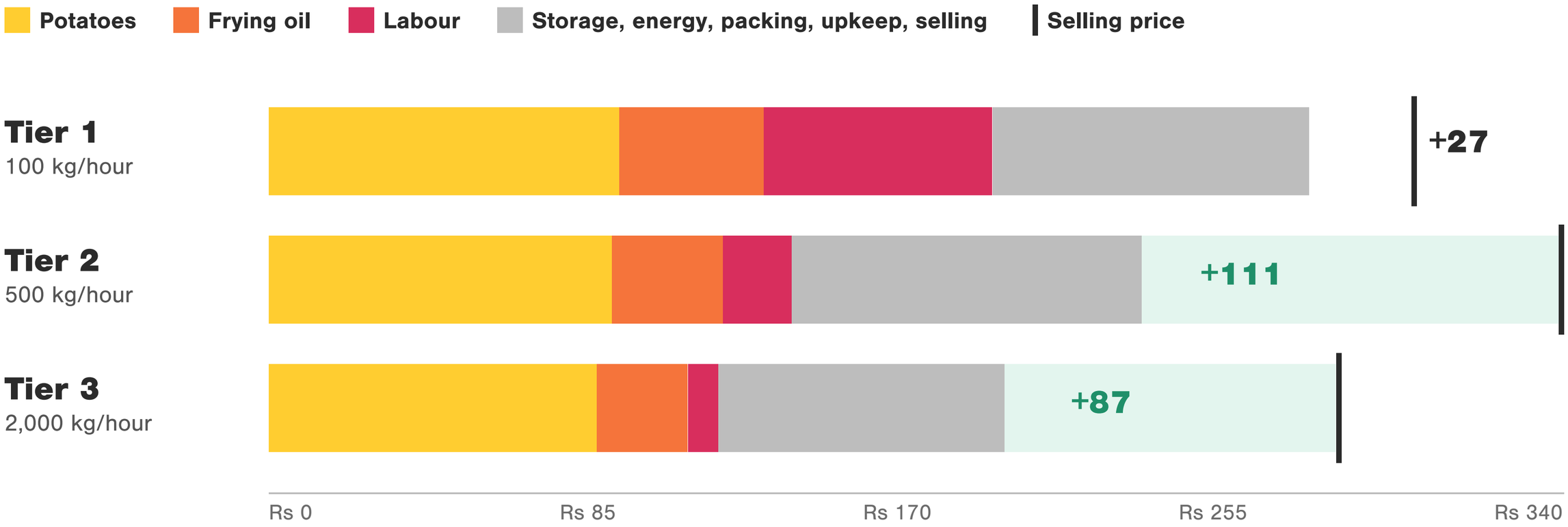
Shelf price is not factory price

Rs 500–700/kg retail packs say little about what a factory earns wholesale

DESK MODEL ESTIMATE

COST AND PRICE PER KILOGRAM, BY TIER

Potatoes are the largest single cost at every scale. The gap between the bar and the price line is EBITDA.



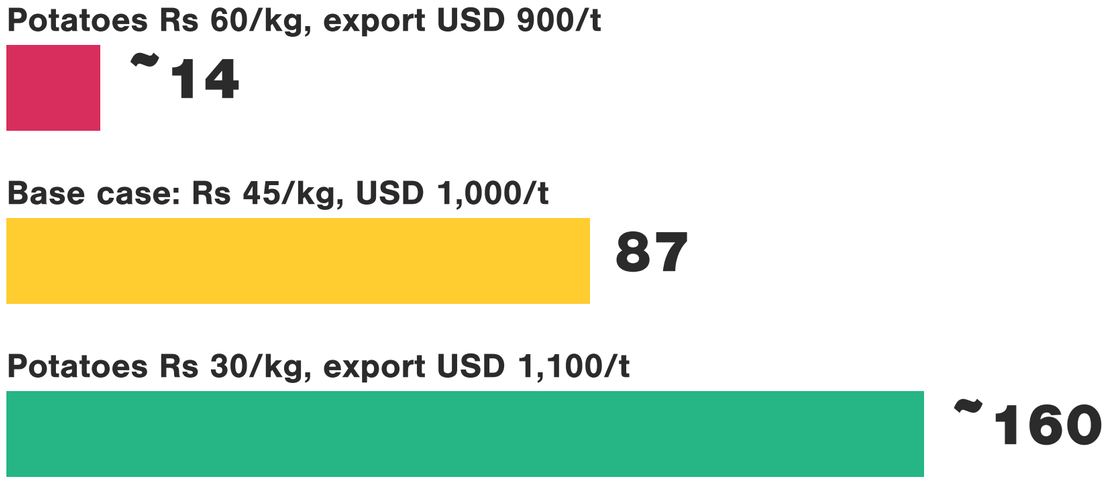
Selling prices: Rs 300 (Tier 1), Rs 340 (Tier 2), Rs 280 FOB (Tier 3).

ILLUSTRATIVE SCENARIOS

MODEL INPUTS AND SENSITIVITIES

ASSUMPTION	TIER 1	TIER 2	TIER 3
Processing-grade potato price	Rs 40/kg	Rs 45/kg	Rs 45/kg
Kg of potato per kg of fries	~2.3	~2.0	~1.9
Capacity utilisation	60%	60%	70%
Target channel	Bulk domestic	Branded domestic	FOB export
Finance rate (payback model)	14%	14%	14%

TIER 3 EBITDA, RS PER KG



Potato cost and export price can swing margin more than tenfold.

Research-model scenarios, not observed market outcomes.

07

WHO SHOULD ENTER?

Six profiles that fit, who should wait, and the questions to answer before buying machinery

BUSINESS FIT BY EXISTING CAPABILITIES

The best entry point depends on what you already own: potatoes, cold storage, customers or seed know-how.

PROFILE	WHY IT FITS	MOST REALISTIC ROUTE
Punjab growers and aggregators	Already manage sourcing, crop quality and grower ties	Contract fries-grade varieties; partner with cold-chain buyers
Cold-store owners	Own key refrigeration and crop-storage assets	Test a small line or joint venture with restaurant buyers
Frozen-food processors and distributors	Know food safety, packaging and routes to market	Add fries as a new product; reuse distribution
Fresh potato exporters	Have buyers, export paperwork and logistics knowledge	Build or partner for frozen processing; secure orders first
Well-funded agri-industrial investors	Can absorb seasonality, financing and export certification	Scale with a technical partner, contract farmers and anchor buyers
Young agri entrepreneurs in GB	Seed and farming skills may matter more than owning a factory	Certified seed multiplication, grower services, seed partnerships

WHO SHOULD PROBABLY NOT ENTER YET

01

A first-time investor who expects a 100 kg/hour line to be reliably profitable on its own

02

A processor without dependable access to the right potato varieties

03

A business with no stable plan for freezing, storage and distribution

04

A founder who assumes supermarket pack prices will become factory margins

Export-led plants should wait until product specifications, compliance plans and buyer economics are confirmed.

BEFORE SPENDING ON MACHINERY

Seven questions every entrant should be able to answer.

01	**Raw materials**	Which variety, contracted from whom, at what price, tested how?
02	**Product spec**	Cut size, solids and sugars, coating, pack size, food-safety rules?
03	**Capacity**	How many kg an hour can actually be sold, not just produced?
04	**Refrigeration**	A complete quote for freezers, storage and backup power?
05	**Buyers**	Signed trials, repeat restaurant or caterer orders, distributor margin?
06	**Finance**	Cash to buy and store seasonal stock and wait for customer payments?
07	**Sensitivity**	What happens if potatoes cost Rs 60/kg or the price slips 10%?

THE OPPORTUNITY IN FIVE POINTS

01	**A large global market**	French fries: ~USD 25.4B in 2026, forecast ~USD 33.1B by 2031	**USD 33.1B**
02	**A record crop, barely processed**	~12M tonnes harvested in 2025–26; ~2.9% goes to processors	**~2.9%**
03	**Value rises with processing**	From ~Rs 63/kg as fresh export to Rs 280–364/kg as frozen fries	**~4–6×**
04	**Seed is the bottleneck**	Estimated ~20K tonnes of domestic seed against ~300K tonnes of demand	**20K / 300K**
05	**Scale and buyers decide margins**	Modelled EBITDA margin rises from ~9% at 100 kg/hour to ~31–33% at larger scale	**9% → 33%**

Source: Figures as cited on earlier slides. Seed and tier figures are estimates.

08

USEFUL RESOURCES

Sector research, market data, published reporting, government sources and practitioner interviews

USEFUL RESOURCES

01 Pakistan Business Council — Value-Added Processing of Potato in Pakistan (2023)

02 Mordor Intelligence — French Fries Market

03 Mordor Intelligence — Pakistan Frozen Food Market

04 IMARC Group — Potato Chips Market

05 APP / PHDEC — 2025–26 harvest and export figures

06 FreshPlaza — Pakistani potato output to exceed 12M tonnes

07 FreshPlaza — border export crisis and farm-sector context

08 Business Recorder — potato glut and policy response

09 ProPakistani — PRI Sahiwal processing varieties (July 2026)

10 Punjab Agriculture — Cost of Production, Potato (2023–24)

11 Indian Potato Sector 2025 Annual Report / IndianPotato.com

12 East-Fruit — EU frozen fry export benchmarks

13 State Bank of Pakistan — export finance schemes

14 Interview: Amjad Elia, seed potatoes, Yasin Valley (October 2026)

Full research: pbc.org.pk/research/value-added-processing-of-potato-in-pakistan

UNLOCKING GROWTH · PROCESSED POTATO PRODUCTS IN PAKISTAN

UNLOCKING GROWTH
SEASON 04

Pakistan grows around 12 million tonnes of potatoes and processes about 3% of them.

The crop is there and local processors exist. The missing pieces are processing-grade seed, reliable cold chains and committed buyers.

pakistanandcounting.com/unlocking-growth

Unlocking Growth series produced by Pakistan & Counting with Accelerate Prosperity, funded by BMZ (Federal Ministry for Economic Cooperation and Development) through KfW (Kreditanstalt für Wiederaufbau).