Project Profile for Local Apple Cider Brewing (Non-Alcoholic) in Uttarakhand

1. INTRODUCTION

Uttarakhand's temperate zones, particularly in districts like Nainital, Almora, and Uttarkashi, produce a diverse range of apples known for their aroma, crispness, and natural sweetness. However, a large percentage of apples—especially second-grade or cosmetically blemished fruit—goes unsold or fetches low prices in fresh markets. Transforming these surplus or underutilized apples into value-added products like non-alcoholic apple cider provides a dual benefit: reducing post-harvest loss and increasing farmer income. Non-alcoholic apple cider, which is essentially fermented or carbonated apple juice with no alcohol content, is gaining popularity as a health drink globally.

Unlike alcoholic cider, the non-alcoholic version can be produced with simpler licensing, reaches wider markets including children and wellness-conscious consumers, and is easier to store and distribute. The process involves crushing, juicing, optional mild fermentation, filtration, and bottling. Local ingredients, minimal preservatives, and small-batch artisanal branding can give this product a premium market identity. The venture is also aligned with the broader shift in Himalayan agriculture towards value addition, entrepreneurship, and food-based micro-industries.

A local apple cider brewing unit, therefore, holds significant promise for Uttarakhand's hill economy. By setting up processing units in apple-growing regions and linking them with farmer clusters or SHGs, the enterprise becomes an anchor for farm-to-bottle value chains. With growing awareness around functional beverages, immunity boosters, and clean-label drinks, non-alcoholic apple cider can serve as both a lifestyle product and a rural livelihood enabler. The project aligns with state missions for food processing, youth entrepreneurship, and Himalayan branding.

2. INDUSTRY OVERVIEW

The global market for non-alcoholic beverages is expanding rapidly, with a rising share allocated to plant-based, probiotic, and fruit-derived drinks. Within this, non-alcoholic apple cider is emerging as a high-demand category, especially among health-conscious consumers looking for low-calorie, antioxidant-rich alternatives to sugary sodas. India is witnessing a similar trend, particularly in urban and tier-2 cities where natural wellness beverages are displacing carbonated soft drinks. The presence of apple-producing belts in Himachal Pradesh and Uttarakhand gives these states a geographical advantage in tapping this market.

Uttarakhand produces more than 1.2 lakh metric tonnes of apples annually, most of it in districts like Uttarkashi, Nainital, and Almora. However, due to poor storage, price volatility, and limited market access, many apples go waste or are sold at throwaway prices. A large part of this post-harvest loss can be arrested through decentralized processing units that convert apples into longer shelf-life products like cider. The state's push under the ODOP (One District One Product) initiative and Devbhoomi Udyamita Yojana (DUY) makes such ventures highly relevant and support-eligible.

The beverage industry in India is becoming more receptive to Himalayan-origin products, particularly those that are artisanal, natural, and sustainably sourced. Apple cider—with its heritage association, health connotation, and premium appeal—fits well within this niche. Institutional buyers, café chains, wellness stores, and even school canteens are likely to adopt such beverages in the coming years. With proper branding and cold chain integration, Uttarakhand-based apple cider units can meet both regional and national demand.

3. PRODUCT DESCRIPTION AND APPLICATIONS

The main product is non-alcoholic apple cider, a refreshing drink made from fresh apple juice that is mildly fermented or naturally carbonated to produce a slightly fizzy and tangy flavor profile. The process includes washing, crushing, juicing, optional enzymatic treatment, controlled fermentation (using yeast or lactic acid bacteria), filtering, and bottling. Variants can include flavored versions with cinnamon, ginger, or wild Himalayan herbs for added health value and local branding. The product can be bottled in glass or PET bottles, depending on market positioning.

In addition to standard bottled cider, the unit can diversify into apple cider concentrate, which can be sold to other processors or diluted for reconstitution. Apple cider vinegar is another long-term product that can be developed using the same juice base with extended fermentation. The pomace (apple residue) generated during processing can be repurposed into animal feed, compost, or pectin extraction, ensuring zero waste. Seasonal special editions, such as 'Winter Spiced Cider', can also be launched to tap into festive and tourist markets.

The applications of non-alcoholic apple cider are diverse. It can be marketed as a healthy alternative to soda, a post-workout drink, or a digestive tonic. It fits into both the wellness and leisure beverage categories, making it suitable for retail stores, juice bars, organic stores, and online delivery channels. Institutional buyers such as hotels, cafés, and eco-resorts in Uttarakhand may also stock the product as a local specialty. With appropriate labeling and nutritional claims, the product can access export channels as well, particularly to Middle Eastern and Southeast Asian markets.

4. DESIRED QUALIFICATIONS FOR PROMOTERS

The ideal promoter for an apple cider brewing unit should have a background in food processing, microbiology, or beverage technology. While formal degrees are not mandatory, knowledge of fruit preservation techniques, basic fermentation principles, and packaging hygiene is essential. Experience in operating juicing or bottling machines and an understanding of seasonal fruit variability will greatly benefit quality consistency. Local entrepreneurs from apple-producing regions who understand farm logistics and fruit grading systems are well-suited for this venture.

The promoter should also be capable of managing procurement, production planning, quality control, and regulatory compliance. Even though non-alcoholic cider does not require excise permissions, food safety certifications like FSSAI registration, batch coding, and lab testing are critical. Understanding shelf-life management, cold chain storage, and bottle sanitation will ensure that the product meets safety standards and builds consumer trust. Familiarity with beverage labeling and branding norms is also recommended.

Business management and marketing skills are equally important. Since this is a consumer-facing product, the promoter must have the ability to network with distributors, organize tasting campaigns, and leverage social media marketing. Partnering with farmer groups for apple

procurement and with design agencies for product packaging can multiply impact. Youth entrepreneurs or SHGs supported by DUY or PMFME schemes may consider cider brewing as a flagship rural enterprise with strong market pull and tourism appeal.

5. BUSINESS OUTLOOK AND TRENDS

The outlook for non-alcoholic apple cider is highly promising, driven by health trends, fruit processing incentives, and consumer interest in local, natural beverages. Across India, the rise of cold-pressed juices, functional beverages, and artisanal products is reshaping the rural food processing narrative. Apple cider fits into this trend as a product that is both heritage-based and modern in appeal. With minimal synthetic additives and a tangy, refreshing taste, it is increasingly seen as a desirable drink among young adults and wellness-focused consumers.

In Uttarakhand, this business also fits into the larger trend of agro-processing linked with native fruit belts. Apple-producing districts are moving from raw fruit sales to value-added chains, and cider is seen as a viable product because it accommodates second-grade apples. State-supported programs like Devbhoomi Udyamita Yojana (DUY) are encouraging rural processing ventures, especially those that enhance farm incomes and utilize local produce. A micro-cider brewing unit thus aligns well with both market and policy signals and can be supported through technical and financial assistance.

Additionally, there is a growing trend in tourism and hospitality where locally made beverages are showcased as part of experiential offerings. Resorts and cafés are often looking for unique, location-specific beverages, and a well-branded cider from Uttarakhand can fulfill this demand. Coupled with eco-friendly packaging, traceable sourcing from apple growers, and low-sugar formulations, the product has the potential to grow from a regional beverage into a Himalayan signature drink with export potential.

6. MARKET POTENTIAL AND MARKETING ISSUES

The market potential for non-alcoholic apple cider in India is growing steadily, with health-conscious urban consumers, institutional buyers, and tourists forming the core demand base. Wellness stores, organic food chains, farm-to-table cafés, and school canteens are emerging as important sales channels. Online grocery platforms and e-commerce storefronts also provide direct-to-consumer access, especially for artisanal and small-batch beverage brands. Within

Uttarakhand, there is also scope to cater to tourists, local families, and pilgrims, especially in districts with high footfall like Nainital, Mussoorie, Ranikhet, and Joshimath.

However, a few marketing issues must be managed. Firstly, awareness of non-alcoholic cider is still limited in many rural and semi-urban markets, where it may be confused with alcoholic drinks or considered exotic. Consumer education around its health benefits and natural origin is crucial. Secondly, pricing must be carefully calibrated—while it is a premium drink, excessive pricing can limit repeat purchases. Another issue is seasonality—apple harvest is concentrated within a few months, requiring effective cold storage or juice concentration to ensure year-round supply.

These challenges can be addressed through well-crafted marketing strategies. Engaging with local influencers, organizing tasting events in tourist zones, collaborating with SHGs for community-level awareness, and ensuring attractive, biodegradable packaging are key tactics. The product can also be positioned as a heritage beverage by linking it with traditional apple growing practices and showcasing farmer stories. Inclusion in government-supported branding initiatives like ODOP and DUY's food processing vertical will further boost trust and visibility.

7. RAW MATERIALS AND INFRASTRUCTURE REQUIRED

The most critical raw material is fresh, pesticide-free apples, ideally sourced directly from local orchards or FPOs in apple-producing districts. Varieties such as Red Delicious, Royal Gala, and Golden Apple are commonly used, though second-grade fruit or juicing-grade apples are preferred for processing due to cost efficiency. On average, 1.3 to 1.5 kg of apples are required to produce one liter of juice. Other inputs include drinking-grade water, selected yeast or probiotic cultures (if fermentation is used), lemon juice or citric acid for pH control, and food-grade preservatives if extended shelf-life is required.

Infrastructure requirements include a washing and grading section, a fruit crusher and pulper, juice extractor or press, filtration unit, optional fermentation tank, and a bottling and labeling line. Storage space for fresh apples, juice concentrate, and packaged cider is essential. For hygiene and quality, the unit must have stainless steel contact surfaces, water filters, UV sterilization, and bottle sanitizing equipment. Cold storage or refrigeration is needed to store juice or finished product during peak summer months.

The facility must be set up in a clean, ventilated area with access to water and electricity. A built-up area of 800 to 1,000 sq ft is sufficient for small-scale production (300–500 liters per day). The site should also have a testing zone for pH, brix (sugar content), and microbial safety. Rainwater harvesting, solar power integration, and biodegradable packaging units may be added for environmental compliance and market appeal. The equipment can be sourced from manufacturers in Dehradun, Rudrapur, or Delhi-NCR.

Table 1: Raw Materials and Infrastructure Requirements

Component	Specification / Quantity	Remarks
Apples	1,000–1,500 kg/week	Preferably second-grade apples for cost efficiency
Water	1,000–1,200 liters/week	Must meet drinking water standards
Yeast culture (optional)	100–200 grams/week	For mild fermentation (if used)
Crusher & Pulper	Capacity: 200–300 kg/hour	Stainless steel body preferred
Juice Extractor / Press	Hydraulic or pneumatic press	To extract clear juice
Filtration Unit	1–2 Micron mesh filter or UV system	Removes particles and ensures clarity
Bottling Machine	Semi-automatic or manual filler + capper	500–1000 bottles/day capacity
Cold Storage	2–3 tons or domestic cold room	For raw fruit and finished product storage
Packaging Material	Glass or PET bottles, shrink wrap, labeling rolls	Eco-friendly options preferred
Built-up Area	800–1000 sq ft	Wash area, processing, storage, labeling zones

8. SUITABLE LOCATIONS IN UTTARAKHAND

The most suitable locations for establishing a non-alcoholic apple cider brewing unit are mid- to high-altitude apple-producing districts such as Nainital, Almora, Pithoragarh, Uttarkashi, and Chamoli. These regions have established apple cultivation traditions, farmer networks, and easy access to juicing-grade apples at reasonable costs. Proximity to orchards reduces transport losses and ensures a fresher fruit supply, which is crucial for juice and cider quality. These areas also align with ODOP designations where apple has been prioritized as the primary crop.

Within these districts, semi-urban blocks like Mukteshwar, Bhimtal, Dwarahat, Harsil, and Munsiyari offer ideal ground conditions. These regions have better road connectivity, easier access to electricity and water, and are also frequented by tourists, which opens direct retail opportunities. The proximity to local markets, small packaging vendors, and agri-input suppliers adds to the feasibility of these locations. Importantly, these areas often have active FPOs, SHGs, or horticulture extension programs, which can serve as procurement or distribution partners.

Access to cold chains or even small village-level cold rooms increases feasibility. Government departments, Krishi Vigyan Kendras (KVKs), and local NGOs working on value chain development can also support technical training and branding. Locations such as Ramgarh and Harsil have existing fruit processing activity, and the cider unit can build on this infrastructure. For scaling the venture, hubs near Haldwani or Rudrapur can be explored for larger packaging and distribution operations.

9. MANPOWER REQUIREMENTS WITH COST

The cider unit will require a compact but skilled team capable of handling food processing, hygiene management, basic fermentation (if applicable), and bottling operations. A Production Supervisor with knowledge of beverage processing, juice safety, and quality control should be hired at a monthly salary of ₹20,000. Their responsibilities include overseeing daily production, managing staff, ensuring cleanliness, and troubleshooting equipment. A Processing Assistant, who handles fruit washing, crushing, and filling, can be employed at ₹12,000/month.

A Bottling and Packaging Worker is essential to manage the labeling and packing line. They can be hired at ₹10,000/month. If the unit engages in fermentation-based cider (even non-

alcoholic), a part-time Food Technician may be employed or consulted at ₹8,000–₹10,000/month for 4–6 months. In addition, seasonal or part-time workers can be brought in during peak apple arrival months (August–October) to manage fruit intake and storage. An Admin-cum-Sales Assistant can be hired part-time to manage orders, records, and local sales coordination.

Overall, the annual manpower cost will range from ₹5 to ₹6 lakhs. Over time, part of the team can be trained from within SHG members or FPO youth to reduce dependence on external hiring. As the unit grows, interns from local food technology or hospitality institutes may also be engaged for marketing, testing, or branding tasks.

Table 2: Manpower Requirements and Cost

Position	No. of Staff	Monthly Salary (₹)	Duration	Annual Cost (₹)	Responsibilities
Production Supervisor	1	₹20,000	12 months	₹2,40,000	Manage production, safety, records
Processing Assistant	1	₹12,000	12 months	₹1,44,000	Apple crushing, juicing, cleanliness
Bottling & Packaging	1	₹10,000	12 months	₹1,20,000	Bottle filling, capping, labeling
Admin/Sales Assistant	1 (part-time)	₹8,000	12 months	₹96,000	Orders, inventory, basic sales tracking
Seasonal Workers	2–3	₹8,000	3–4 months	₹72,000 – ₹96,000	Fruit handling, loading, sanitation
Total Estimated Cost	–	–	–	₹5,72,000 – ₹5,96,000	Inclusive of part-time and seasonal support

10. IMPLEMENTATION SCHEDULE

The cider unit can be established and made operational within 10 to 12 months. In Months 1–2, the entrepreneur should finalize the site, secure permissions (FSSAI registration, pollution clearance if needed), and begin infrastructure development. This includes civil work, water and electricity lines, and purchase of processing and bottling equipment. Machinery installation,

pipeline fitting, and procurement of fermentation/storage tanks should be completed by Month 4.

Staff recruitment and basic training sessions can be held in Months 3–5. Simultaneously, procurement channels with local farmers or FPOs must be established. Test batches of cider should be conducted in Months 5–6 to finalize taste, fermentation cycle, and packaging. Quality testing (pH, TSS, microbial count) can be carried out in partnership with labs or KVKs. Branding, label design, and packaging trials should begin during Month 6, with soft launch in the local market.

Months 7–9 are the peak apple harvesting season, and full-scale production should be aligned with this period. From Month 10 onward, distribution can be expanded to cafés, wellness stores, and exhibitions. Promotional events, demo stalls, and collaborations with local tourism boards can be launched in Months 10–12 to maximize early traction. The entire implementation schedule should be tightly project-managed, with quality and hygiene audits built into each stage.

Table:3 Implementation Schedule

Timeline (Months)	Key Activities
Months 1–2	Site finalization, FSSAI and local registration, infrastructure setup begins
Months 3–4	Procurement of machinery, installation, water/electricity setup
Month 5	Staff recruitment, trial production batches, lab testing, fermentation trials
Month 6	Packaging material finalization, pilot sales, branding and outreach planning
Months 7–9	Full-scale production during apple season, marketing to local stores and cafés
Months 10–12	Institutional sales, tourism tie-ups, consumer feedback collection

11. ESTIMATED PROJECT COST

The estimated capital and operational cost for a small-scale non-alcoholic apple cider brewing unit ranges from ₹11 lakhs to ₹13 lakhs. The largest share—around ₹4 to ₹5 lakhs—is allocated to food-grade processing equipment, including crushers, pulpers, filtration systems, and bottling lines. Another ₹2.5 to ₹3 lakhs is needed for infrastructure including civil work, plumbing, wiring, and sanitation setup. Marketing, branding, and packaging expenses (including initial batch design and printing) will require ₹1–1.5 lakhs.

Working capital for Year 1—including apple procurement, staff salaries, water, electricity, food-grade cleaning agents, yeast, bottle procurement, and basic logistics—will be around ₹4.5 to ₹5 lakhs. If a solar power unit or cold room is installed, additional cost may arise. The unit may receive up to 35–50% subsidy under PMFME, AIF, or DUY schemes, bringing down the burden on the promoter significantly. If the promoter owns the land or building, the total project cost can be reduced by ₹1–1.5 lakhs.

Table 4: Estimated Project Cost

Component	Estimated Cost (₹)	Remarks
Processing Equipment	₹4,00,000 – ₹5,00,000	Crusher, juicer, filter, bottling unit
Infrastructure Setup	₹2,50,000 – ₹3,00,000	Civil works, sanitation, water/electricity setup
Packaging & Branding	₹1,00,000 – ₹1,50,000	Bottle, label, shrink wrap, branding design
Working Capital (Year 1)	₹4,50,000 – ₹5,00,000	Salaries, raw materials, utility bills, logistics
Total Estimated Cost	₹11,00,000 – ₹13,50,000	Inclusive of machinery and first-year operations

12. REVENUE STREAMS

The main revenue stream will be the sale of bottled non-alcoholic apple cider to local consumers, tourists, wellness stores, cafés, and institutional buyers. Each 250–300 ml bottle can be priced between ₹30–₹50 depending on packaging, flavor, and location. A micro-unit

with a production capacity of 500–800 bottles per day during peak season can sell 1.2 to 1.5 lakh bottles annually. Bulk orders to resorts or tourism departments can bring in consistent revenues, while sales at local haats, exhibitions, or online platforms can fetch higher per-unit margins.

Secondary revenue streams include the sale of value-added variants such as spiced cider (with cinnamon or ginger), herbal cider blends, and limited-edition holiday packs. The unit can also develop an apple cider concentrate to be sold in 5-litre cans to juice bars or school canteens, priced between ₹200–₹250/litre. Leftover pomace (apple pulp) may be sold to farmers as animal feed, converted into compost, or dried and used for pectin or fiber powders, generating a modest but consistent side income.

As the unit gains recognition, opportunities will arise in co-branding with eco-resorts, offering private-label bottling, and bundling cider into tourist welcome kits. Institutional catering (e.g., hostels, canteens, yatri niwas) may become a reliable recurring channel. Long-term opportunities also lie in online subscription models and wellness gift boxes. With the right linkages, revenue diversification can significantly enhance profitability.

Table 5 Revenue Streams

Revenue Source	Unit Price (₹)	Estimated Volume (Annual)	Estimated Annual Revenue (₹)	Remarks
Bottled Non-Alcoholic Cider	₹30 – ₹50/bottle	1,20,000 – 1,50,000 bottles	₹36,00,000 – ₹75,00,000	Retail, tourist points, wellness stores
Apple Cider Concentrate	₹200 – ₹250/litre	2,000 – 3,000 litres	₹4,00,000 – ₹7,50,000	For juice counters, cafes, schools
Herbal/Spiced Variants	₹40 – ₹60/bottle	10,000 – 20,000 bottles	₹4,00,000 – ₹12,00,000	Premium line, seasonal products
Pomace Sales/Compost	₹3/kg	5,000 – 7,000 kg	₹15,000 – ₹21,000	Animal feed or compost

Revenue Source	Unit Price (₹)	Estimated Volume (Annual)	Estimated Annual Revenue (₹)	Remarks
Custom Branding/Resorts	₹500/box	300 – 500 boxes	₹1,50,000 – ₹2,50,000	Tourism partnerships
Total Estimated Revenue	–	–	₹45,65,000 – ₹97,71,000	Varies by capacity, marketing, and retail mix

13. PROFITABILITY ESTIMATE

In the first year, the unit is expected to operate at 40–50% of full capacity, generating revenue in the range of ₹18–25 lakhs and a modest net profit of ₹2–3 lakhs after accounting for marketing and setup depreciation. By the second year, with improved distribution and production consistency, revenues can rise to ₹40–60 lakhs annually with ₹8–12 lakhs in net profit. By Year 3, assuming near-full utilization and premium variants, the unit can comfortably reach ₹75–90 lakhs in turnover with profit margins between 25% to 30%.

Profitability improves sharply once fixed costs such as equipment and branding are amortized. Bulk procurement of bottles, establishing direct farm sourcing, and reusing packaging can further reduce input costs. With minimal wastage, locally sourced apples, and diversified distribution channels, the venture can generate strong returns. Strong branding and digital sales can push margins even higher for specialty variants.

14. OPERATIONAL FLOW

1. Apple Procurement and Pre-Processing (August–October)

The first step involves sourcing fresh apples, primarily juicing-grade or second-grade fruits, directly from local farmers, SHGs, or FPOs during the harvesting months of August to October. Apples should be firm, ripe, and relatively free of rot, even if they are misshapen or blemished externally. Sourcing locally reduces transport costs and ensures freshness, which directly affects juice quality.

Once brought to the unit, apples are weighed, inspected, and sorted. Damaged or overly soft fruits are rejected or diverted to compost. The selected apples are then washed thoroughly in a clean water tank or washing line using food-grade sanitizers. This step removes dirt, pesticide residues, and microbial contaminants. A manual or semi-automatic washer may be used, depending on the scale. The apples are allowed to drain or dry on clean trays before crushing.

2. Crushing and Juice Extraction

The cleaned apples are then fed into a crusher or pulper, which grinds them into a fine pulp. This pulp includes skin, seeds, and flesh. The apple pulp is then transferred to a juice press—either a hydraulic press or a pneumatic bladder press—for juice extraction. This equipment exerts pressure to separate liquid juice from the fibrous residue (pomace).

The raw juice collected at this stage is cloudy, rich in nutrients, and highly perishable. Depending on the intended product type, the juice may be settled for a few hours or immediately transferred for mild fermentation or clarification. The leftover pomace is collected separately and can later be dried, composted, or sold as animal feed, ensuring minimal waste.

3. Optional Mild Fermentation (1–3 Days)

This step is optional and depends on whether the enterprise chooses to lightly ferment the juice for flavor enhancement and natural carbonation. If fermentation is intended, selected food-grade yeast or probiotic cultures are added to the juice and stored in food-safe fermentation tanks. This is done under temperature-controlled conditions (10–20°C) for 24 to 72 hours.

During this time, yeast or lactic acid bacteria convert some of the natural sugars into mild organic acids and carbon dioxide, giving the cider a slightly tangy and fizzy taste. Since the product is non-alcoholic, the fermentation must be closely monitored and halted before alcohol levels exceed 0.5% (as per FSSAI standards for non-alcoholic beverages). This is achieved by chilling or pasteurizing the juice once the desired taste profile is reached.

4. Filtration and Clarification

The fermented or unfermented juice is then passed through a fine mesh filter (1–2 microns) to remove suspended particles, pulp residue, or microbial colonies. In artisanal units, gravity-

based settling or cloth filtration may be used. For clearer products, natural clarifying agents like bentonite clay, citrus extract, or apple pectin may be added.

Some units also install UV treatment chambers to reduce microbial load and extend shelf life without using chemical preservatives. The juice is then held in sanitized tanks or food-grade drums prior to bottling. The clarified juice must have the desired parameters: pH between 3.0–4.0, Brix (sugar level) around 10–12%, and no detectable alcohol.

5. Bottling and Labeling

The clarified cider is transferred to a bottling station where it is filled into glass or PET bottles (usually 250–300 ml for retail or 1-litre for bulk use). Before filling, bottles are washed, sterilized, and dried to ensure hygiene. The bottling process can be manual (using funnel-based fillers) or semi-automatic (with gravity or pump fillers). The bottles are then sealed using manual cappers or automatic screw-cap machines.

Labels are applied post-capping. Labels should include product name, batch code, ingredients, FSSAI license number, nutritional facts, and storage instructions. Some units also use QR codes for traceability. Shrink wrapping or boxed packaging is done in batches of 6 or 12 bottles for easier distribution.

6. Storage and Distribution

Finished bottles are stored in a cool, dark room to prevent light and heat exposure, which may affect flavor and shelf life. For units with access to cold storage, refrigerated shelves or room cooling units may be used. The product is then dispatched to local retailers, wellness stores, school canteens, or tourism kiosks. Online orders or gift packs may be delivered using third-party logistics or aggregator platforms.

The sales cycle aligns with tourist seasons, local fairs, and religious festivals when demand for health-conscious, non-alcoholic beverages increases. Unsold stock is monitored closely, and older batches may be discounted or converted into vinegar if shelf-life permits.

The flow chart of the operational flow stands as follows:

1. Apple Procurement (Aug–Oct)
└──► Grade and sort apples
└──► Wash and sanitize
2. Crushing & Juicing
└──► Crush apples into pulp
└──► Extract juice using hydraulic press
3. Optional Mild Fermentation (1–3 days)
└──► Add yeast/lactic culture
└──► Maintain temperature and pH
4. Filtration and Clarification
└──► Use mesh filter or UV
└──► Add natural clarifying agent (if needed)
5. Bottling and Labeling
└──► Fill in sterilized bottles
└──► Label, seal, and batch code
6. Storage & Distribution
└──► Cold store or ambient room
└──► Ship to retailers or directly sell

Table 6 Profitability Estimate

Year	Estimated Revenue (₹)	Estimated Expenses (₹)	Net Profit (₹)	Profit Margin (%)	Remarks
Year 1	₹18,00,000 – ₹25,00,000	₹16,00,000 – ₹22,00,000	₹2,00,000 – ₹3,00,000	10–15%	Trial year, low capacity, high branding cost
Year 2	₹40,00,000 – ₹60,00,000	₹30,00,000 – ₹48,00,000	₹8,00,000 – ₹12,00,000	20–25%	Scale-up phase, improved procurement
Year 3	₹75,00,000 – ₹90,00,000	₹52,00,000 – ₹66,00,000	₹20,00,000 – ₹24,00,000	25–30%	Premium product lines, full utilization, bulk orders

15. BREAK-EVEN ANALYSIS

The break-even point is expected to be achieved between 18 to 22 months of operation, assuming moderate scale and partial grant support. The fixed annual cost including salaries, packaging, minor repairs, electricity, and marketing is expected to be around ₹6.5–₹7 lakhs. Variable costs such as fruit, bottles, and flavoring agents increase with output but maintain a stable per-unit margin. At an average price of ₹40 per bottle, the unit must sell around 1,80,000 – 2,00,000 bottles to break even.

Strategic pre-booking from local stores, tie-ups with tourism boards, and branding as a 'Devbhoomi Heritage Drink' can significantly reduce time to break-even. If the unit receives capital support or uses community-owned cold chains, this can reduce the initial capital load, accelerating breakeven to within 14–16 months.

Table 7: Break-Even Analysis

Parameter	Value (₹)	Remarks
Fixed Annual Costs	₹6,50,000 – ₹7,00,000	Salaries, utilities, repairs, outreach
Average Selling Price	₹40/bottle	Inclusive of packaging and taxes

Parameter	Value (₹)	Remarks
Break-Even Volume	1,80,000 – 2,00,000 bottles	Achievable in Year 2 with full harvest season supply
Break-Even Revenue	₹70,00,000 – ₹80,00,000	Inclusive of premium variants
Estimated Time to Break Even	18 – 22 months	May reduce with DUY/PMFME subsidy

16. MARKETING STRATEGIES

Marketing for the cider unit must focus on two core narratives: health and heritage. At the local level, sampling stalls at village haats, fairs, yatri niwas, and hill station cafés can help build immediate recognition. Partnerships with local grocery stores, medical stores, and SHGs can provide low-cost grassroots outreach. Branded refrigerators or kiosks at tourism points can increase visibility. Emphasis should be placed on the product being “alcohol-free,” “farm-to-bottle,” and “Himalayan-grown,” which resonates with both religious and wellness-conscious consumers.

Regional marketing efforts should involve FPO tie-ups for bundled sales (e.g., apple + cider gift boxes), QR-coded traceability to orchards, and storytelling about local apple growers. Participating in craft beverage expos, food tech fairs, and state-supported ODOP promotion drives can yield bulk buyers. Label design must be clear, informative, and visually aligned with eco-conscious values. Packaging should reflect the seasonal and natural freshness of apples without artificial additives.

At a broader level, the venture should create an online presence through a basic e-commerce website, WhatsApp Business catalogue, and Instagram/Facebook for farmer stories and production videos. Collaborations with food influencers, travel vloggers, and café chains in cities like Dehradun, Delhi, and Chandigarh can drive early adopters. Participation in state tourism packages, Ayurvedic hotels, or online gifting platforms can open export opportunities in the long term.

17. MACHINERY AND EQUIPMENT REQUIREMENTS

Table 8: Overview of Machinery Requirement

Machinery / Equipment	Specification / Capacity	Purpose	Estimated Cost (₹)
Apple Washer and Sorter	Manual or semi-automatic	Cleaning, sanitizing, sorting of apples	₹50,000 – ₹1,20,000
Apple Crusher / Pulper	200–300 kg/hour	Crushing apples into pulp	₹70,000 – ₹1,50,000
Juice Extractor / Hydraulic Press	300–500 kg/hour	Pressing juice from apple pulp	₹1,00,000 – ₹2,00,000
Stainless Steel Fermentation Tank (Optional)	300–500 L capacity	For controlled mild fermentation (if applicable)	₹60,000 – ₹1,00,000
Juice Filter (UV/mesh)	100 litres/hour	Clarifying juice before bottling	₹40,000 – ₹80,000
Pasteurizer (if shelf-life >7 days)	200–300 L/hour	Extending shelf-life via heat treatment	₹1,20,000 – ₹1,80,000
Bottle Washer and Sterilizer	Semi-auto	Ensuring hygiene of reused bottles	₹30,000 – ₹70,000
Bottle Filling Machine	Semi-automatic, 4–6 nozzles	Filling bottles with juice	₹60,000 – ₹1,00,000
Cap Sealing Machine	Manual or electric	Sealing bottles with caps	₹15,000 – ₹40,000
Labeling Machine	Manual or semi-automatic	Attaching labels to filled bottles	₹25,000 – ₹50,000

Machinery / Equipment	Specification / Capacity	Purpose	Estimated Cost (₹)
Cold Storage Unit	2–3 MT capacity	Short-term storage of raw fruit and cider	₹1,50,000 – ₹2,50,000
Water Purification Unit	RO+UV system	Clean drinking-grade water for processing	₹25,000 – ₹45,000

Total Machinery Cost Estimate: ₹5.5 lakhs – ₹9.5 lakhs (depending on automation level and scale)

VENDORS IN UTTARAKHAND & NEARBY REGIONS

1. Krishna Food Processing Machines

- **Location**: SIDCUL Industrial Area, Rudrapur, Udham Singh Nagar, Uttarakhand
- **Contact**: +91-9412397000 / +91-8868064029
- **Website**: krishnafoodmachines.com
- **Specialization**: Juice extractors, pulpers, bottle fillers, and cold storage installation
- **Remarks**: Offers customized turnkey setups for fruit processing units

2. Shiva Engineers

- **Location**: Pune (serves Uttarakhand via Dehradun office)
- **Contact**: +91-9766468376 / +91-9822266603
- **Website**: shivaengineers.com
- **Specialization**: Apple juice and cider plant solutions, fermentation tanks, hygienic piping
- **Remarks**: Offers small-scale, semi-automated cider lines with fermentation control

3. Hytek Food Equipments

- **Location**: Ghaziabad, Uttar Pradesh (delivery & setup in Uttarakhand)
- **Contact**: +91-9811115564
- **Website**: hytekfoodequipments.com

- **Specialization**: Bottle fillers, pulpers, apple washers, pasteurizers
- **Remarks**: Trusted by FPOs and PMFME units across Uttarakhand and Himachal

4. Rama Udyog & Food Tech Solutions

- **Location**: Selaqui Industrial Area, Dehradun, Uttarakhand
- **Contact**: +91-7895199305 / +91-9720677250
- **Email**: ramaudyog@gmail.com
- **Specialization**: Fruit processing equipment, including crushers, bottlers, and UV filters
- **Remarks**: Good local support, offers on-site repair and training

5. Rajasthan Mechanical Works (RM Group)

- **Location**: Udaipur, Rajasthan (supplies across North India)
- **Contact**: +91-9414150610
- **Website**: rmgroupind.com
- **Specialization**: Juice pasteurizers, SS tanks, apple pulpers, small-scale bottling units
- **Remarks**: Government empaneled supplier under PMFME and AIF schemes

Suggested Vendor Engagement Strategy

- Compare 2–3 vendor quotations for core machinery (crusher, extractor, filter, bottle filler).
- Prefer vendors offering post-installation training, warranty, and AMC (Annual Maintenance Contract).
- Ask for reference units already installed in Uttarakhand or Himachal Pradesh.
- Cross-check that the machinery is compatible with FSSAI norms and corrosion-resistant (SS 304/316 grade).
- For startups under DUY/PMFME, request the vendor to supply necessary compliance documentation for subsidy claim.

18. ENVIRONMENTAL BENEFITS

The apple cider brewing unit promotes sustainable agriculture by incentivizing the use of cosmetically defective but nutritionally intact fruits, thereby reducing post-harvest losses. By utilizing apples that would otherwise go unsold or discarded, the venture helps cut greenhouse

gas emissions from rotting organic matter. The project also supports local biodiversity as it encourages the continued cultivation of native or traditional apple varieties, often grown without heavy chemical use in Uttarakhand's mid-hill regions.

The use of organic clarifying agents, low-sugar formulations, and minimal preservatives contributes to a healthier production process. Pomace reuse—either as animal feed or compost—closes the waste loop, while solar-powered cold storage and biodegradable bottles further reduce environmental impact. Use of rainwater harvesting and water recycling for bottle washing can bring additional sustainability gains. Small units can also be built using bamboo and stone infrastructure for natural insulation.

Finally, the project spreads ecological awareness through its brand narrative. Educating consumers about apple seasonality, mountain farming practices, and the benefits of native fruit consumption builds long-term respect for Himalayan agriculture. As more consumers associate cider with traceability and green sourcing, the venture serves as a model for climate-friendly food enterprises in hill economies.

19. FUTURE OPPORTUNITIES

The cider unit's future expansion may include alcoholic cider production (with proper licensing), apple cider vinegar (ACV), and probiotic or sparkling cider variants. These products tap into growing markets for wellness drinks, functional nutrition, and fermentation-based beverages. Apple kombucha, vinegar drinks, or cider tonics can open additional value chains. The unit may also license its product to urban distributors or collaborate with larger food startups under co-branding.

Backward integration into apple sourcing by setting up an orchard partner program or buying centers can ensure consistent supply and price stability. The venture may become a node in apple-based clusters where drying, packaging, vinegar, and cider are co-located. Forward integration can include café chains or retail kiosks showcasing Uttarakhand-grown beverages and snacks. A franchise model or SHG-run cider carts can also be developed for tourist towns.

Over time, the unit may evolve into a local beverage brand symbolizing Himalayan purity, freshness, and heritage. With carbon offsets, farmer traceability, and fair trade certification, it may access international ethical markets. The venture can also serve as a training hub under

DUY or PMFME for hill-based food processors, thereby creating replicable, climate-resilient micro-enterprises across Uttarakhand's fruit belts.

Disclaimer

Only a few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not imply any recommendation.