Section A: Business Model Design

Business Model: **Solar-Powered Water Desalination Startup**

A. Product/Service Idea

1->Name: **SolarFlow**

2->Description:

Portable and solar-powered device converting seawater/brackish water to clean and drinking water. Uses reverse osmosis and photovoltaic technology for efficient desalination.

3->System Components

Solar Collectors:Sun-tracking panels that heat water using sunlight.

High-Pressure Storage Tank:Stores heated water under pressure as a mix of liquid and vapor.

Steam Engines:

Two engines:

Engine 1: Directly powers the reverse osmosis (RO) pump to filter seawater into fresh water.

Engine 2: Generates electricity for other system needs.

Oil-Fired Boiler:

Backup heater to ensure the system works even without sunlight.

4->How It Works

Primary Mode (Mixed Solar/Oil):

Starts with Solar:The RO system activates only when solar energy heats the storage tank to near-maximum pressure.

Backup with Oil:

If sunlight drops and tank pressure falls, the oil boiler kicks in automatically to keep the RO running.Switches back to solar once the tank regains pressure.

All-Solar Mode:

Operates purely on solar energy.If sunlight is low, the RO system reduces output (partially shuts down) to maintain pressure

5->Key Features:

Affordable:It is low-cost material made but quality is not compromised.

Portable: Lightweight,very easily transportable and can be easily assembled in remote areas.

Sustainable: 100% solar-powered, zero emissions, and minimal brine waste (eco-friendly disposal).

Durable:do not corrode easily and are durable.

B. Target Market

Primary Customers:

Rural Communities: Arid regions in Sub-Saharan Africa, Middle East, and South Asia lacking clean water access.

Humanitarian Organizations: NGOs (e.g., UNICEF, Red Cross) for disaster relief in flood/earthquake zones.

Secondary Customers:
Eco-Tourism Businesses: Off-grid resorts/campsites needing sustainable water solutions.
Small-Scale Farmers: Coastal farmers using treated water for irrigation.

C. Revenue Generation

B2B & B2G Sales:
Sell devices to governments/NGOs at bulk rates (200–500/unit).
Premium models for eco-tourism or military use (800–1,200/unit).
Consumer Models:
Subsidized pricing for low-income households via microloans or pay-as-you-go plans.

Service Revenue:
Subscription Plans: Maintenance, filter replacements, and brine disposal (10–20/month).
Water-as-a-Service (WaaS): Charge (0.01–0.03) per liter of water produced.
Partnerships & Grants: Get grants from UN/governments for SDG 6 (Clean Water).Sell carbon credits generated by substituting diesel-driven pumps.

D. Environmental & Social Impact

Environmental:
CO2 Reduction: Every unit prevents ~2 tons of CO2/year by replacing fossil fuel-reliant pumps.
Waste Management: Brine byproduct reused for salt harvesting or diluted to safety to prevent inflicting harm to ecosystems.

Social:
Clean Water Access: Provides 1,000+ liters/day/unit, for 50–100 individuals.
Health & Empowerment: Prevents waterborne illnesses and frees time (primarily for women/children) consumed by water carrying.

E. Balancing Profit & Environmental Consciousness

Cost Efficiency: Utilize recycled materials (such as aluminum) and local production to save money and carbon emissions.

Scalability with Purpose: Invest 20% of profit in R&D for recycling of brine waste and energy efficient upgrades.Train local technicians for maintenance of devices, generating jobs and encouraging long-term adoption.

Transparent Impact: Publish annual reports of liters of water generated, CO2 emissions reduced, and community health metrics.Pursue B Corp certification to draw eco-sensitive consumers and investors.
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Circular Partnerships: Partner NGOs (e.g., Water.org) for distribution in disadvantaged areas.Partner with universities for innovation in brine waste Cost Savings through Sustainable Operations.

Environmental Safeguards: Reduce the use of the oil-fired boiler by maximizing solar energy collection and storage. Formulate a step-by-step plan for replacing the oil-fired boiler with a renewable energy-based backup system.

E.Long-Term Vision

Expand to SolarFlow Grids: Larger solar desalination plants for community-wide water access and agriculture.Advocate for policies subsidizing renewable water tech in developing nations.

2->ITC's e-Choupal Initiative: Alignment with Entrepreneurship, Economic Development, and Market Efficiency

What is INTRAPRENEURSHIP?

Intrapreneur focuses on innovation and creativity, and transforms an idea into a commercial venture, while operating within the corporate environment.Thus, intrapreneurs are intra (within organization) entrepreneurs who nurture their creativity while following goals of the organization.Intrapreneurship is a structure that permits an employee to behave like an entrepreneur within a business.

e-Choupal as Intrapreneurship

e-Choupal is an ICT-enabled intervention in rural India, providing agriculture-related information and services to farmers. Widely acclaimed as a Bottom-of-Pyramid (BoP)intervention, e-Choupal is known for successfully demonstrating sustainable deployment of ICTs for strengthening agricultural market linkages. This internal innovation allowed ITC to reduce procurement costs while creating social impact, exemplifying intrapreneurship .

2. Alignment with Entrepreneurship Principles

A. Innovation in e-Choupal

Definition: Innovation is the process of introducing new processes, technologies, or methods which disrupt current structures and produce value.

Application in e-Choupal:

ITC's e-Choupal introduced internet-enabled kiosks ("Choupals") to rural India, revolutionizing the way farmers received agricultural information. The kiosks provide live market prices, weather, and expert farm advice, instead conventional mandi (market) system controlled by middlemen. For instance, soybean producers in Madhya Pradesh could now see current prices in remote markets through the kiosk, allowing them to receive better prices or sell to ITC directly. This electronic infrastructure also involved localized content in local languages so that it would be accessible to low-literacy farmers.

B.Risk-Taking in e-Choupal

Definition: Risk-taking involves committing resources to uncertain ventures with potential high rewards.

Application in e-Choupal:

ITC heavily invested in rural internet infrastructure in spite of problems like irregular power supply, poor digital awareness, and unreliable connectivity. For instance, the company utilized local farmers as Sanchalaks (kiosk operators) to bridge the technology divide. ITC took the financial risk of setting up 6,500+ kiosks across 10 states, spending ₹50–60 lakh annually on maintenance.

C.Value Creation in e-Choupal

Definition: Value creation is the generation of tangible value for stakeholders in the form of increased efficiency, cost reduction, or revenue increase.

Application in e-Choupal:

For Farmers: By cutting out intermediaries, farmers achieved 10–15% better price.For instance, wheat farmers in Uttar Pradesh got ₹2,200 per quintal through e-Choupal, as opposed to ₹1,900 in conventional mandis.

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3. Contribution to Economic Development

Income Generation:

Farmers shifted from subsistence to market-oriented farming, increasing incomes. A NABARD study noted a 20–30% rise in net profits for soybean farmers using e-Choupal.

Rural Empowerment:

Greater access to information on best practice like soil tests optimized productivity. Female decision-participation improved with locality-based kiosks (IFAD, 2008).

Employment:

Professions such as Sanchalaks and logistics partners brought secondary livelihoods, preventing urban migration.

4. Risk Mitigation for Farmers

Price Risk Reduction:

Real-time prices allowed farmers to choose optimal selling periods and buyers. As per a research study done by Minten et al. (2016), price volatility was minimized by 3–5% among users of e-Choupal.

Production Risk: Agronomic advice and weather alerts reduced crop damage risks. Forfor example, soybean growers used disease-resistant seeds, reducing losses by 15%.

Counterparty Risk: Direct transactions with ITC reduce middlemen exploitation,ensuring timely payments.

5. Enhancing Market Efficiency

Disintermediation:

By connecting farmers directly to ITC's procurement centers, transaction costs were reduced by 60%, as intermediaries were eliminated.

Transparency:

Computerized mandi (market) prices reduced information asymmetry, allowing for competitive pricing. Farmers could compare ITC's prices with the local markets.

Supply Chain Optimization:

ITC integrated e-Choupal with procurement logistics, reducing wastage and storage costs. Farmers were paid sooner, improving cash flow.

References

Shatat, M., & Riffat, S. B. (2014). Water desalination technologies utilizing conventional and renewable energy sources. International Journal of Low-Carbon Technologies
Global Water Intelligence (GWI). (2022). Desalination Market Report.Prahalad, C. K. (2005).

United Nations Development Programme (UNDP). (2020). Policy Frameworks for Renewable Energy in Developing Countries.

The Fortune at the Bottom of the Pyramid. Wharton School Publishing. Upton, D. M., & Fuller, V. A. (2004). The ITC eChoupal Initiative. Harvard Business School Case.

Gandhi, R., Veeraraghavan, R., & Toyama, K. (2007). Digital Green: Participatory Video for Agricultural Extension. ICTD Conference.

Sarkar, S., & Singh, J. (2006). e-Choupal: ITC’s Rural Networking Project.
IIM Bangalore Case Study. World Bank (2003). India: ICT Use in Agriculture. World Bank Report