

PROJECT PROPOSED BY
**PENTOREUM INNOVATIONS PVT. LTD.
MOLECULE TECHNOLOGIES LTD. AND
MOLECULE TECHNOLOGIES AFRICA LTD.**

**FOR THE BENEFIT AND DEVELOPMENT OF
THE PEOPLE OF UGANDA**

PREPARED BY:

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PROJECTS ENVISAGED:

PARTICLE BOARD, MEDIUM DENSITY FIBER BOARD (MDF), FLOOR / WALL TILES, ETC., MADE OUT OF THE INVASIVE WEED, WATER HYACINTH;

B. FUEL BRICKS MADE OUT OF RICE HUSK FOR DOMESTIC AND INDUSTRIAL USES;

C. MANUFACTURE OF SAGO FROM CASSAVA STARCH; AND

D. PURIFICATION OF EFFLUENTS FROM THE BIOGAS PLANTS ESTABLISHED, TO PREVENT THE POLLUTION OF 'WHITE NILE' RIVER.

ALSO

ESTABLISHING DRINKING WATER SUPPLY SYSTEM USING WATER FROM KIVU LAKE, DEMOCRATIC REPUBLIC OF CONGO

WATER HYACINTH MENACE, LAKE VICTORIA, KISUMU, KENYA



GENERAL BACKGROUND AND INFORMATION: DEMOCRATIC REPUBLIC OF UGANDA

- TOTAL AREA: 236,040 SQUARE KM;

INLAND WATER BODIES - 69 LAKES: 36,330 SQ.KM.;

- POPULATION: 39.3 MILLION; GDP (PPP): US\$ 84.93 BILLION;
PER CAPITA GDP: US\$ 2,600 (2016);

- GDP (GROWTH RATE): 4.9% (2016),  GDP (COMPOSITION BY SECTOR
OF ORIGIN): Agriculture- 24.5%, Industries- 21%, Services- 54.4%;

- LABOUR FORCE: 19.03 MILLION; UNEMPLOYMENT: 9.4%;
POPULATION BELOW POVERTY LINE: 24.5%.

PROPOSAL

A. PARTICLE BOARD, MEDIUM DENSITY FIBER BOARD (MDF), FLOOR/WALL TILES, ETC., MADE OUT OF THE WEED “WATER HYACINTH”

[PROF. VARKEY MATHEW, PATENT APLN. NO. 2418/CHE/2013A, INDIA PATENTS]

PREAMBLE

WATER HYACINTH IS LABELLED AS “THE WORLD’S WORST WATER WEED” CAUSING EXTENSIVE ENVIRONMENTAL, SOCIAL AND ECONOMIC PROBLEMS [UNEP GLOBAL ENVIRONMENTAL ALERT SERVICE (GEAS), 2013];

IT IS FOUND IN LAKES, ESTUARIES, WETLANDS, MARSHES, PONDS, DAMBOS, SLOW FLOWING RIVERS, STREAMS, AND WATER WAYS, IN THE TROPICAL AND SUBTROPICAL REGIONS.

IN UGANDA, THE WEED WAS FIRST FOUND IN ‘LAKE KYOGA’ IN 1988 - ’89 AND IN ‘LAKE VICTORIA’ IN 1989 -’90.

THREATS POSED BY WATER HYACINTH



UNEP Global Environmental Alert Service (GEAS)

Taking the pulse of the planet; connecting science with policy

Website: www.unep.org/geas

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April 2013

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Thematic focus: Ecosystem Management

Water hyacinth: Can its aggressive invasion be controlled?



GIVEN THE COMPLEXITY OF CONTROL OPTIONS AND THE POTENTIAL FOR CLIMATE CHANGE TO ASSIST THE SPREAD OF WATERHYACINTH, IT IS CRITICAL TO DEVELOP COMPREHENSIVE MANAGEMENT STRATEGIES AND ACTION PLANS. A MULTIDISCIPLINARY APPROACH SHOULD BE DESIGNED, WHICH ENSURES THAT THE HIGHEST POLITICAL AND ADMINISTRATIVE LEVELS RECOGNIZE THE 12 POTENTIAL SERIOUSNESS OF THE WEED. PLANS SHOULD ALSO STATE CLEARLY THE ROLE OF EACH GOVERNMENT DEPARTMENT, STAKEHOLDERS, MUNICIPAL COUNCILS AND LOCAL COMMUNITY INVOLVED IN THE FIGHT AGAINST WATER HYACINTH.

- ▶ WHILE RESEARCHERS CONTINUE TO INVESTIGATE THE PERCEIVED POTENTIAL USES OF WATER HYACINTH, THE CURRENT NEGATIVE IMPACTS OF THE WEED FAR OUTWEIGH ITS BENEFITS. THE USE OF WATER HYACINTH AS RAW MATERIAL IN COTTAGE INDUSTRY SHOULD NOT ENCOURAGE PROPAGATION OF THE WEED, BUT RATHER HELP CONTROL ITS GROWTH.
- ▶ **DESTRUCTION OF BIODIVERSITY:** WH CHALLENGES THE ECOLOGICAL STABILITY OF FRESHWATER WATER BODIES, OUT-COMPETING ALL OTHER SPECIES, POSING A THREAT TO AQUATIC BIODIVERSITY. ALSO, NEGATIVELY AFFECTING MICROBES, WH PREVENTS THE GROWTH AND ABUNDANCE OF PHYTOPLANKTON UNDER LARGE MATS, ULTIMATELY AFFECTING FISHERIES.

OXYGEN DEPLETION AND REDUCED WATER QUALITY: LARGE WH MATS PREVENT TRANSFER OF OXYGEN FROM THE AIR TO WATER SURFACE; DECOMPOSING MATURE LEAVES DEplete OXYGEN CONTENT IN WATER TO DANGEROUS LEVELS, THREATENING THE LIVES OF FISH; WATER GETS POLLUTED ALSO, BY THIS DECAYING.

BREEDING GROUND FOR PESTS AND VECTORS: MOSQUITOS CAUSING MALARIA, FILARIASIS, DENGUE FEVER, ETC., BREED IN THE WH MATS; SNAILS CAUSING DISEASES AND BACTERIA CAUSING CHOLERA, ETC, ALL GET MULTIPLIED ON THESE MATS.

► BLOCKAGE OF WATERWAYS HAMPERING AGRICULTURE, FISHERIES, RECREATION AND HYDROPOWER:

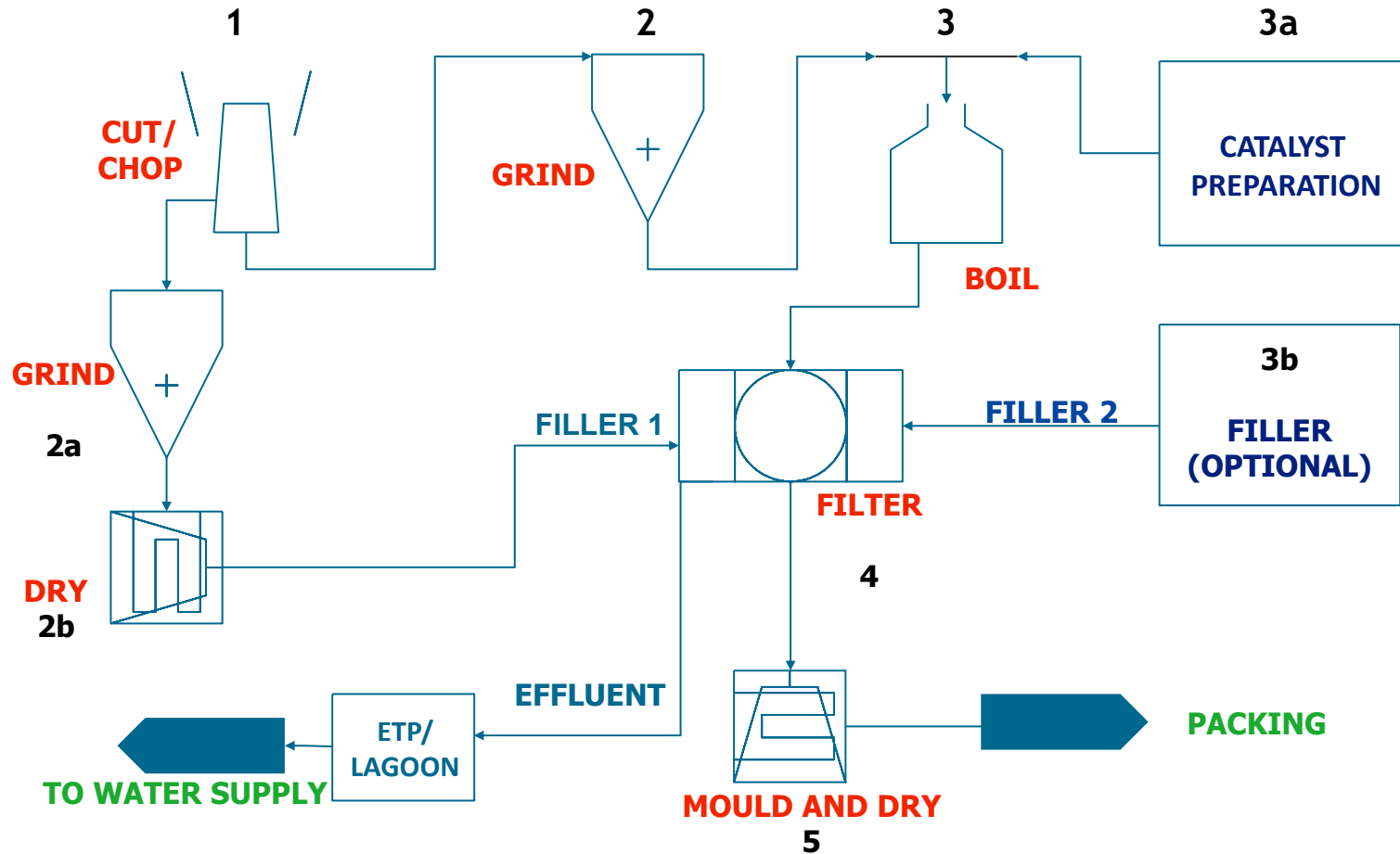
WH MATS CLOG WATERWAYS DUE TO THE RAPID REPRODUCTION AND PROPAGATION, AFFECTING SOCIOECONOMIC AND SUBSISTENCE ACTIVITIES, LIKE SHIP AND BOAT NAVIGATION, RESTRICTED ACCESS TO WATER FOR FISHERIES, TOURISM AND RECREATION. IN MOST OF SUCH WATER BODIES FISH CATCH HAS DWINDLED TO 30% OR LESS.

IT IS ESTIMATED THAT THE FLOW OF WATER IN THE NILE COULD BE **REDUCED BY UPTO ONE-TENTH** DUE TO INCREASED LOSSES FROM EVAPOTRANSPIRATION BY WH IN LAKE VICTORIA [IT IS OBSERVED THAT THE **WATER LEVEL** IN LAKE VICTORIA HAS GOT **LOWERED BY ONE METER** IN THE TWO DECADES 1995 TO **2015!!!!**]

**THE MILLIONS OF PEOPLE WHO ARE
DEPENDING ON THE WATER SOURCES FOR
THEIR DAILY BREAD ARE IN GREAT DISTRESS.**

**URGENT NEED OF THE TIME:
CONVERT THE MENACE WEED INTO
RESOURCE**

PROCESS FLOW CHART



SWOT ANALYSIS OF THE PROJECT

STRENGTHS

- ▶ WATER HYACINTH, AS A MENACE, IS AFFECTING THE LIVES OF MILLIONS OF OUR CITIZENS; AS A RESULT THE COUNTRY ITSELF IS LOSING MUCH, AS THE GDP IS CONCERNED; REMOVAL OF WH IS VERY ESSENTIAL FOR THE INCREASE IN GDP.
- ▶ LARGE QUANTITIES AVAILABLE AND THE MATERIAL DOUBLES IN MASS IN ABOUT 12 DAYS, THEREBY PROVIDING LARGE QUANTITY OF RAW MATERIAL FOR THE INDUSTRY. MORE PROCESSING UNITS CAN BE ESTABLISHED IN VARIOUS PLACES FOR REMOVING LARGER QUANTITIES AT THE SAME TIME, FOR THE ADVANTAGE OF CITIZENS AS WELL AS THE LABOUR FORCE.

- ▶ **THE TECHNOLOGY IS VERY NEW, AND COMPARITIVELY EASY FOR PROCESSING; REQUIRES LESSER TIME, ENERGY AND FACILITIES FOR THE PROCESSING.**
- ▶ **THE PRODUCT IS 'GREEN', HAVING NO TOXIC OR HARMFUL CHEMICALS INVOLVED IN THE PROCESS, OR IN THE PRODUCT TO BE USED BY CONSUMERS, AND USEFUL IN MANY APPLICATIONS.**

WEAKNESS

- ▶ THERE ARE VERY MANY SIMILAR PRODUCTS IN THE WORLD MARKET.
- ▶ COLLECTION AND TRANSPORTATION NEEDED FOR THE RAW MATERIAL, AND ALSO FOR THE PRODUCTS.
- ▶ NEW MACHINERY TO BE DESIGNED AND MANUFACTURED FOR THE NEW PLANT.

OPPORTUNITY

AVAILABILITY OF TECHNOLOGY (WHICH IS A RECENT INVENTION), FOR THE FIRST TIME IN THE WORLD;

THE PRODUCT CAN BE USED IN VARIOUS APPLICATIONS, LIKE, STRUCTURAL ENGINEERING, CONSTRUCTION, HOUSEHOLD FURNITURE, TRANSPORT SYSTEMS, AUTOMOBILE INDUSTRY, ETC., SUBSTITUTING WOOD, PLYWOOD, PLASTICS, ETC.;

A GOVERNMENT WITH STRONG WILL, TAKING THE INITIATIVE.

THREATS

PENETRATION INTO THE MARKET OF EARLIER PRODUCTS MANUFACTURED BY ESTABLISHED BUSINESS GIANTS;

ENSURING AVAILABILITY OF FUNDS FOR INVESTMENT, ESPECIALLY WORKING CAPITAL;

SCARCITY OF ELECTRIC POWER (?) FOR THE INDUSTRY;

TRANSPORTATION OF THE PRODUCTS TO VARIOUS PARTS OF THE WORLD.

FINANCIAL DATA / ESTIMATIONS:

FOR A PULPING PLANT PROCESSING 600 TONS OF
RAW MATERIAL IN THREE SHIFTS (200 TONS X 3) PER DAY

| Sl No. | Particulars | Specification | Amount in INR. | Amount in USD |
|--------|--------------------------|---------------|-----------------------|---------------------|
| 1 | Land | 2 Acre | 50000000.00 | 833333.33 |
| 2 | Building / 2 Sheds | 5000 Sq. ft | 20000000.00 | 333333.33 |
| 3 | Water hyacinth machinery | automated | 60000000.00 | 1000000.00 |
| 4 | Continuous Moulding | 1 | 2000000.00 | 33333.33 |
| 5 | Hydraulic Moulding | 1 | 2000000.00 | 33333.33 |
| 6 | Process Air conditioning | | 500000.00 | 8333.33 |
| 7 | Transformer | | 10000000.00 | 166666.67 |
| 8 | Weigh Bridge | | 5000000.00 | 83333.33 |
| 9 | Office furnishing | | 100000000.00 | 1666666.67 |
| 10 | Compound Wall | | 10000000.00 | 166666.67 |
| 11 | Security | | 10000000.00 | 166666.67 |
| 12 | Project Eng. | | 10000000.00 | 166666.67 |
| 13 | Working Capital | 6 months | 200000000.00 | 3333333.33 |
| 14 | Misc. & Contingencies | | 60000000.00 | 1000000.00 |
| 15 | Vehicle | | 5000000.00 | 83333.33 |
| | Total | | 544,500,000.00 | 9,075,000.00 |

ON FINANCE AND FINANCIAL SUPPORT

- **CAPITAL EXPENDITURE: INR. 544,500,000/- OR (US\$ 9,075,000/-)**
- **AT THE PEAK CAPACITY WORKING**
EXPENSE FOR COLLECTION OF 1200 TONS OF WATER HYACINTH
PER DAY: INR. 240,000/- (US\$ 4,000/-)
[THIS RESPONSIBILITY MAY BE TAKEN CARE OF BY THE GOVERNMENT]
- **EXPENDITURE INCLUDING WAGES, SALARIES, TRANSPORTATION, ETC.:**
PER DAY: INR. 600,000/- (US\$ 10,000/-)

- ▶ **COST OF CHEMICALS, POWER (ELECTRICITY), WATER, PACKING MATERIALS, ETC.:**
PER DAY: INR 300,000/- (US\$ 5,000/-)
- ▶ **TOTAL EXPENDITURE INCURRED BY THE COMPANY**
PER DAY: INR. 900,000/- (US\$ 15,000/-)
- ▶ **INCOME FROM THE SALE OF PRODUCTS PER DAY: INR. 1,000,000/- (US\$ 16,700/-)**
- ▶ **BALANCE PER DAY: INR. 100,000/- (US\$ 1,670/-)**

DEBT SERVICING, BENEFITS AND INCENTIVES TO STAFF, INSURANCE PREMIUM, TAXES, ETC., CAN BE MET FROM THIS AMOUNT, AND CAN HAVE A REASONABLE NET PROFIT.

- ▶ **THE TOTAL NUMBER OF PERSONS EMPLOYED IN THE UNIT WOULD BE ABOUT 300, FOR THE THREE SHIFTS TOGETHER**
- ▶ **WORKING CAPITAL FOR 6 MONTHS: INR. 16.2 MILLION (US\$ 2.7 MILLION)**

INVESTMENT PLAN

- ▶ THE COMPANY PROPOSES TO INVEST 25% OF THE FIXED CAPITAL
- ▶ SEEKING 75% OF THE FIXED CAPITAL AS INTEREST PAYING ADVANCES

AN *EXPRESSION OF INTEREST (EOI)* MAY BE
SIGNED BY

THE DEMOCRATIC REPUBLIC OF UGANDA (DRU)

ON ONE SIDE

AND PENTOREUM INNOVATIONS PVT. LTD.

AND MOLECULE TECHNOLOGIES LTD.,

ON THE OTHER SIDE.

THANK YOU

PRESENTED BY

PROF. VARKEY MATHEW
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PENTOREUM INNOVATIONS PVT. LTD.