



**Kijito Windpower**

*Wind of Development*



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# KIJITO WINDPUMPS

INFORMATION BOOKLET



For further information on our range of Windpumps, please do not hesitate to contact us at Bobs Harries Engineering Ltd

**Bobs Harries Engineering Ltd**

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## Our History

The Harries family came to Kenya in 1904 and dealt with agriculture. They imported in 1912 pineapples to Kenya and under Bob Harries developed the family farm into a large business.

After the death of his father in 1970, Mike Harries inherited the farm. He donated in the same time one month a year in a medical mission. During these trips, he discovered that much of the blindness that the surgeons were treating was as a result of Trachoma. The basic cause of this was that children in the arid areas of East Africa often did not have enough water to wash their faces, and this lack of hygiene resulted in the disease.

During the seventies, Kenya often suffered from frequent and long drought periods resulting rationing of mains electricity from the hydro powered grid system.

After experimenting how bad sanitarian conditions and water scarcity led to tragic situation and how frequent electricity supply was fatal for economical development in Kenya, Mike Harries decided to go to alternative energies and develop them in Kenya.

In 1977, the excellent coffee prices enabled him to invest in a famous technique to improve water supply for communities of dry areas: wind pumping. In collaboration with the NGO "The Intermediate Technology Development Group" (ITDG), they developed the first windmill "Kijito". In 1979 the actual commercial production started.

With 25 years experience in the manufacture and installation of more than 375 Windpumps both in Kenya and abroad, BHEL has developed a range of reliable and sturdy machines capable of withstanding storms and pumping water for years with only minimal maintenance and attention.

These machines run through a range of rotor diameters from 8ft (capable of pumping heads of up to 100ft), to the larger 26ft diameter Windpumps which are able to lift water from deep boreholes of 500ft. The company is currently employing 29 workers.

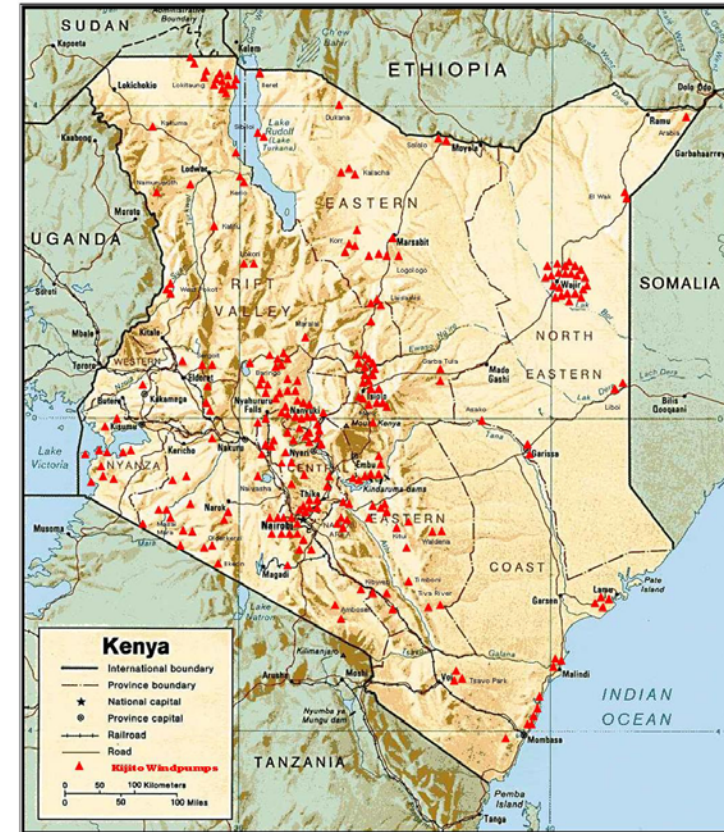


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## KIJITO SALES IN KENYA

JULY 1979 to MAY 2006 ~ 279 WINDPUMPS



Tanzania	41	UK	2	Jordan	1
Uganda	18	Comoros	2	Rwanda	1
Somalia	15	Botswana	2	Holland	1
Sudan	8	Niger	2	Ethiopia	1
Nigeria	4	USA	1	Canada	1

Kenya	279
Exports	100
<b>TOTAL</b>	<b>379</b>



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### Water Yield (cum/day)

MODEL	12ft (3.7m)			16ft (4.9m)			20ft (6.1m)			24ft (7.4m)			26ft (7.9m)		
Wind (m/s)	light 2-3	med 3-4	strong 4-5	light 2-3	med 3-4	strong 4-5	light 2-3	med 3-4	strong 4-5	light 2-3	med 3-4	strong 4-5	light 2-3	med 3-4	strong 4-5
Head (m)	10	28	59	21	71	150	39	107	227	61	167	354	70	192	407
10	5	14	29	10	35	75	19	53	113	30	83	177	35	95	204
20		7	15	5	18	37	10	27	57	15	42	89	17	48	102
40			5	4	14	28	7	20	43	11	31	66	13	36	76
60			3	3	9	19	5	13	28	8	21	44	9	24	51
80			2		7	16	4	10	24	7	18	36	8	21	41
100			5		6	12	3	9	19	5	14	29	6	16	33
120			4		4	9		7	14	4	10	22	5	13	28
150															

These are our Jan 2008 Export prices, in US Dollar.

ITEM	2008 Kijito	12ft Kijito	16ft Kijito	20ft Kijito	24ft Kijito	26ft Kijito
Machine price (inc tower)	3010	8070	9380	12,630	13,515	13,975
10ft Tower extension	—	1230	1230	1405	1405	1405
Shallow well adaptor	—	340	340	375	375	375
Pump rods (per foot)	4.1	5.85	5.85	5.85	5.85	5.85
Stuffing box	205	385	385	385	385	385
2" Pipefittings (Chinese)	145	330	330	330	330	330
2¾" deepwell cylinder	—	1515	1515	1515	1515	1515
3¾" deepwell cylinder	—	—	2450	2450	2450	2450
8" shallow well cylinder	—	—	—	—	2300	2300
6" shallow well cylinder	—	—	—	1700	1700	1700
3¾" shallow well cylinder	—	—	1590	1590	1590	1590
2½" shallow well cylinder	1040	—	—	—	—	—
2¾" shallow well cylinder	—	1140	1140	—	—	—
5" shallow well cylinder	—	2135	2135	2135	2135	2135
Packaging	250	360	410	490	550	595

Installation technician \$95 per day  
Prices subject to change without notice

### Kijito windpumps, a long past, a promising future...



*Manufacturing Kijito windpumps at Thika*



*24ft Kijito Windpump pumping water from Lake Victoria near Musoma Tanzania for lakeside irrigation (UNDP Irrigation Project)*



*Left: Desert irrigation in Northern Kenya*

*Centre: A 24ft Rotor Kijito on a 40ft tower irrigating Lake side crops for villagers in Tanzania  
Right: 20ft Kijito Windpumps pumping for the Catholic Mission at Lokitaung, Turkana, Kenya.*





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## Product Information

**Windpower: a long past, a promising future** - Wind is one of the greatest sources of natural energy. It is free and is available day and night for the production of economical power to pump water or to generate electricity. The wind has been used as a source of power for over 2000 years; the giant livestock industries of Australia and the USA were, and still are, dependant on windpumps by the million. Today, with oil and engine prices constantly rising, windpower is enjoying a big revival and is set to make a major contribution to our energy needs in the 21st century. Windpower is therefore both a technology of the past and a new technology for the future. It combines experience with promise.

**No fuel and low maintenance costs** - A windpump needs no fuel and little maintenance and will last 20 years and more. The cost of financing a windpump compares very favourably with any conventional pumping system. Using a windpump can immediately help your cash flow. Provided local wind conditions are adequate, a windpump will always produce water more cheaply and with less trouble than an engine. When the next fuel shortages occur, the windpump will be immune to the problem.

**Conditions required** - Windpumps are very sensitive to windspeed; a slight increase in mean windspeed produces a marked increase in output of water. For example, only a 25% increase in windspeed results in a 100% increase in energy availability. The wind energy captured is in proportion to the area of the windpump rotor. Therefore a machine with a rotor twice as big in diameter as another will actually produce over four times as much water under given operating conditions.

**Rotors** - KIJITOS are at present available in four rotor sizes; 12ft, 16ft, 20ft, 24ft and 26ft. The rotors are scientifically designed for high aerodynamic efficiency compared with traditional windpump designs. The rotor blades can be individually replaced if damaged for any reason.

**Mechanical transmission and lubrication** - Power from the rotor is transmitted to the pump via a unique crank and rocker arrangement. All rotating components run on highest quality long life ball and roller bearings, which are easily lubricated in a few minutes twice a year using a vehicle grease gun.

**Governing and storm protection** - The tail of the KIJITO is set to allow the rotor to turn automatically edge-on to the wind whenever gusts exceed 20mph (9m/s). The machine is designed to withstand extreme storm conditions of 100mph (45m/s). Governing is completely automatic and requires no human intervention.

**Towers** - KIJITOS are normally supplied on 30ft (10m) tripod towers. However extension sections are available as options to increase the rotor height and get better performance. All towers are hinged at their bases to allow easy erection and servicing. This also greatly facilitates access to the borehole when the windpump is lowered, and reduces borehole and pump maintenance time and costs.

**Finish** - KIJITOS are finished to the highest standards. A special marine finish is available as an option for use on sea coasts where corrosion can otherwise pose serious problems for most steel structures.



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**Kijito 2008 windpump** - We are proud to introduce the new 2008 windpump. With assistance from CWD of the Netherlands, we have developed this small simple machine. This windmill has been tested both here and in the Netherlands for some years and has been found to be fully operational, reliable, and capable of surviving severe storms. At a 6m head the 2008, under ideal conditions, is capable of pumping yields of up to 4,400gpd (20cum), assuming 10 hours of useful wind per day. It can pump heads of up to 120ft (36.5m). However, the greater the head the less water it will pump. The machine is easily installed by the customer, using instructions provided, and is transportable in most 1 tonne pick-ups. If you would prefer, a foreman can be provided to oversee the installation assuming housing is provided.

### 2008 KIJITO CHARACTERISTICS:

- **STARTINGWINDSPEED:** 2.5m/sec
- **RATED WINDSPEED:** 7m/sec, giving a rotor speed of 1.5rps (90rpm)
- **MAXIMUM ROTOR SPEED:** 2rps (120rpm)
- **SURVIVAL WINDSPEED:** 40 m/sec
- **DIAMETER OF ROTOR:** 8ft with 12 blades  
**TRANSMISSION:** Power is transmitted from the eccentrically placed rotor, through a rocker to the pumprods and pump
- **TOWER:** Steel tubular mast with steel rod guides hinged at the tower base. Height 23ft. 5ft extension available
- **TAIL:** Hinged side vane attached to the transmission via a steel boom providing automatic over speed control by means of yawing activated by the eccentrically placed rotor and hinged vane
- **FURLING:** Done simply by hand with a stop rod on the transmission
- **WEIGHT:** Rotor 50lbs (22.7kgs), Transmission 104lbs (47kgs)
- Tower 198lbs (90kgs)