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Potassium is one of the three essential plant nutrients, the other two being nitrogen and phosphorus. It is supplied commercially as potash, i.e., potassium-bearing minerals, ores and processed products.

Bedded marine evaporite deposits and surface & subsurface potash-rich brines are principal sources of potash. The principal ore is sylvinite, a mixture of sylvite (KCl) and rock salt (NaCl). In India no such deposits are available for commercial exploitation and the entire requirements of potassic fertilizers for direct application as well as for production of complex fertilizers are met through imports.

RESOURCES

As per UNFC system, total resources of potash as on 1.4.2005 are estimated at 21,815 million tonnes in the country. Rajasthan alone contributes 94% resources, followed by Madhya Pradesh (5%) and Uttar Pradesh the remaining 1% (Table - 1).

OCCURRENCES

Glauconitic sandstones/greensands deposits which are available in plenty can be used as an alternative indigenous resource for potash. Glauconite is essentially a complex hydrous

silicate of iron and potassium chiefly with ferric oxide and partly with ferrous oxide. It contains K₂O from 4-7%.

In India, glauconite is commonly associated with sand/sandstones, shale, marl and occasionally with limestone. Glauconitic sandstones of Vindhyan Group represents oldest glauconite deposits which are well developed in Son Valley region covering parts of Madhya Pradesh and Uttar Pradesh. In Madhya Pradesh occurrences are in Sidhi and Satna districts. In Banda and Mirzapur districts of Uttar Pradesh, deposits of same origin are located. Glauconite occurs in shale, limestone and Tal formations at Duggada and Tal Valley in Garhwal and at Mussoorie, Dehradun districts in Uttarakhand. In Rajasthan, glauconitic sandstones/shales occur in Chittorgarh, Kota, Karauli, Jaisalmer and Barmer districts. In Gujarat, glauconite is found in Ukra formation at Guneri in Kachchh district. In Himachal Pradesh, glauconite of hydrothermal origin is found in Kumla-Kathwar area of Sirmaur district. In Kerala, glauconite occurs in Quilon Limestone and sea bed sediments of Thiruvananthapuram coast.

USES

Potash is an essential nutrient for protein synthesis and it aids plants to use water more efficiently. Glauconitic sandstones/greensands are

**Table - 1 : Reserves/Resources of Potash as on 1.4.2005
(By Grades/States)**

(In million tonnes)

Grade/State	Reserves Total (A)	Remaining resources				Total resources (A+B)
		Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
All India : Total	-	18142	3651	22	21815	21815
By Grades						
Glauconite	-	878	1068	-	1946	1946
Polyhalite	-	13985	2179	-	16164	16164
Sylvite	-	2072	404	-	2476	2476
Unclassified	-	1206	-	22	1228	1228
By States						
Madhya Pradesh	-	1206	-	-	1206	1206
Rajasthan	-	16936	3462	22	20420	20420
Uttar Pradesh	-	-	190	-	190	190

Figures rounded off.

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used directly in acidic soils in eco-friendly manner, as glauconitic sand mixes homogeneously with the soil and provides potash as nutrients for plants. It also increases soil fertility and improves soil texture, porosity and permeability due to more or less uniform grain size. Potassium chloride (KCl) is the principal fertilizer product equivalent to 60 - 62% of K₂O. Other salts for fertilizer use are potassium sulphate, potassium magnesium sulphate and potassium nitrate. Potassium chloride and potassium nitrate are used in manufacture of glass, ceramics, soap, synthetic rubber and chemicals. Potassium nitrate is used in explosive manufacture.

CONSUMPTION

Reported consumption of potash increased to 1,048 thousand tonnes in 2007-08 in fertilizer industry from 1,038 thousand tonnes in 2006-07 (Table -2). Apparent consumption of potash fertilizer rose to 3.69 million tonnes in 2007-08 from 3.03 million tonnes in 2006-07 based on export-import data.

Table - 2 : Reported Consumption of Potash Salt, 2005-06 to 2007-08

Industry	(In tonnes)		
	2005-06(R)	2006-07	2007-08 (p)
All Industries	1097800	1038100	1048400
Fertilizer	1097800 (10)	1038100 (10)	1048400 (10)

Figures rounded off.

Data collected on non-statutory basis.

Figures in parentheses denote the number of units in organised sector reporting consumption.

WORLD REVIEW

The world reserve base is estimated at approximately 18,000 million tonnes of K₂O content. It is located mainly in Canada, Russia, Belarus, Germany, Brazil, Israel, Jordan, China and USA (Table-3).

The world production of potash in 2007 was 33.5 million tonnes in terms of K₂O content as against 28.7 million tonnes in 2006. Canada remained the leading producer of potash with 34% share in total production in 2007, followed by Russia (19%), Belarus (15%), Germany (11%), Israel (7%) and USA (4%) (Table-4).

Table – 3 : World Resources of Potash (By Principal Countries)

(In '000 tonnes of K ₂ O content)	
Country	Reserve base
World : Total (rounded)	18000000
Belarus	1000000
Brazil	600000
Canada	11000000
Chile	50000
China	450000
Germany	850000
Israel*	580000
Jordan*	580000
Russia	2200000
Spain	35000
Ukraine	30000
United Kingdom	30000
USA	300000
Other countries	140000

Source: Mineral Commodity Summaries, 2008.

** Total reserve base in the Dead Sea is arbitrarily divided equally between Israel and Jordan.*

Table – 4 : World Production of Potash (By Principal Countries)

(In '000 tonnes of K ₂ O content)			
Country	2005	2006	2007
World : Total	31900	28700	33500
Belarus	4928	4605	4971
Canada (chloride)	10140	8528	11426
Germany (potassic salt)	3664	3625	3637
Israel (chloride)	2224	2187	2187
Jordan	1097	1020	1067
Russia	6266	5274	6373
USA (potassic salt)	1200	1100	1200 ^e
Other countries	2381	2361	2639

Source : World Mineral Production, 2003-2007.

Canada

Canada having sylvinitic resources is the world's largest producer. Potash mines in Canada showed a production of 11.4 million tonnes of K₂O in 2007 as compared to 8.5 million tonnes of K₂O in 2006. There are eight conventional and two solution mines in Saskatchewan and New Brunswick.

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FOREIGN TRADE

Exports

Exports of potash fertilizer increased to 27,436 tonnes in 2007-08 from 12,844 tonnes in the previous year. Exports were mainly to China (21%), Malaysia (16%), UAE (15%), Sri Lanka (14%), Kuwait (8%) and Thailand (6%). Exports of potassium nitrate decreased to 101 tonnes in 2007-08 from 127 tonnes in the previous year. Exports were mainly to USA and Saudi Arabia. Exports of potassium salts (natural) decreased substantially to 10 tonnes in 2007-08 from 2,535 tonnes in 2006-07. (14%) (Tables - 5 to 7).

Imports

Imports of potash fertilizer increased to 3.72 million tonnes in 2007-08 from 3.04 million tonnes in the previous year. Israel (28%), Canada (22%), Russia (19%), Jordan (11%), Belarus (9%) and Germany (5%) were the main suppliers in 2007-08. Imports of potassium nitrate also increased to 3,751 tonnes in 2007-08 from 3,343 tonnes in the previous year. Israel and China were the main suppliers of potassium nitrate in 2007-08 (Tables - 8 and 9).

**Table - 5 : Exports of Potash Fertilisers
(By Countries)**

Country	2006-07		2007-08	
	Qty. (t)	Value (Rs. '000)	Qty. (t)	Value (Rs. '000)
All Countries	12844	129881	27436	307544
Malaysia	137	1795	4449	59626
China	-	-	5721	48530
Sri Lanka	11	299	3758	44675
UAE	57	845	4172	38788
Kuwait	-	-	2189	30985
Thailand	9	383	1768	19305
Vietnam	220	1908	1220	14197
Pakistan	-	-	1451	12784
Italy	198	3823	72	6829
Mozambique	10184	96211	-	-
Other countries	2028	24617	2636	31825

**Table - 6 : Exports of Potassium Nitrate
(By Countries)**

Country	2006-07		2007-08	
	Qty. (t)	Value (Rs. '000)	Qty. (t)	Value (Rs. '000)
All Countries	127	16064	101	7998
USA	67	12396	42	5450
Saudi Arabia	41	1481	45	1188
Qatar	-	-	7	780
Thailand	-	-	4	292
Bahrain	2	232	2	239
Djibouti	-	-	1	32
UAE	10	1350	++	4
Bangladesh	4	458	-	-
Ghana	1	46	-	-
Nepal	1	57	-	-
Other countries	1	44	++	13

**Table - 7: Exports of Potassium Salt (Natural)
(By Countries)**

Country	2006-07		2007-08	
	Qty. (t)	Value (Rs. '000)	Qty. (t)	Value (Rs. '000)
All Countries	2535	9871	10	783
Chinese Taipei/ Taiwan	-	-	10	783
Iran	364	1924	-	-
Sudan	140	352	-	-
Thailand	1135	2859	-	-
UAE	896	4736	-	-

**Table - 9 : Imports of Potassium Nitrate
(By Countries)**

Country	2006-07		2007-08	
	Qty. (t)	Value (Rs. '000)	Qty. (t)	Value (Rs. '000)
All Countries	3343	81818	3751	95122
China	3153	76997	1505	42938
Israel	-	-	1644	39495
Chile	189	4812	442	9699
UAE	-	-	105	2186
Singapore	-	-	51	638
Italy	-	-	++	88
Germany	1	9	4	77
USA	-	-	++	1

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**Table - 8 : Imports of Potash Fertiliser
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	3038537	30880094	3718950	39147074
Israel	456698	4617527	1042592	11020046
Canada	643917	6443363	824729	8333211
Russia	643443	6516231	694547	7388465
Jordan	394511	4025939	413963	4446129
Belarus	288985	2926121	339974	3572934
Germany	98739	1050146	174402	1911393
Latvia	96256	983190	105299	1088740
Ukraine	118259	1201834	44222	405377
Spain	80956	833384	-	-
UK	78776	801887	-	-
Other countries	137997	1480472	79222	980779