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POTASH

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GOVERNMENT OF INDIA
MINISTRY OF MINES
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40 Potash

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 & sub-surface potash-rich brines are principal sources of potash. The principal ore is sylvinite, a mixture of sylvite (KCl) and rock salt (NaCl). In India, resources exist mainly as polyhalite, syloite and glauconite. However, there is no commercial exploitation. The entire requirement of potash for direct application and for production of complex fertilizers are met through imports.

RESOURCES

As per UNFC system, total resources of potash as on 1.4.2010 are estimated at 21,816 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 K_2O from 4-7%.

In India, glauconite is commonly associated with sand/sandstones, shale, marl and occasionally with limestone. Glauconitic sandstones of Vindhyan Group represent 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. The deposit of same origin are located in Banda, Sonbhadra and Mirzapur districts of Uttar Pradesh. Glauconite occurs in shale, limestone and Tal formations at Duggad and Tal Valley in Garhwal and Mussoorie in Dehradun districts, 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 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 K_2O. 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. Potash is also used as a raw material for manufacturing complex fertilizers.

CONSUMPTION

Domestic consumption of potash was about 1.42 million tonnes in 2012-13 in fertilizer industry same as in the previous year (Table-2).

Table – 1 : Reserves/Resources of Potash as on 1.4.2010 (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**	**3652**	**22**	**21816**	**21816**
By Grades						
Glauconite	–	878	1068	22	1968	1968
Polyhalite	–	13985	2179	–	16164	16164
Sylvite	–	2072	404	–	2476	2476
Unclassified	–	1206	–	–	1206	1206
By States						
Madhya Pradesh	–	1206	–	–	1206	1206
Rajasthan	–	16936	3461	22	20419	20419
Uttar Pradesh	–	–	190	–	190	190

Figures rounded off.

Table – 2 : Consumption of Potash Salt 2010-11 to 2012-13

(In tonnes)

Industry	2010-11	2011-12(R)	2012-13(P)
All Industries	**1884900**	**1421400**	**1419800**
Fertilizer	1884900(11)	1421400(11)	1419800(11)

Figures rounded off.
Figures in parentheses denote the number of units in organised sector reporting consumption.*
*(*Includes actual reported consumption and/or estimates made wherever required).*

WORLD REVIEW

The world reserves are estimated at approximately 6,072 million tonnes of K_2O content. It is located mainly in Canada, Russia, Belarus, Germany, Brazil, China, USA, Israel and Chile (Table-3).

The world production of potash in 2012 was 31.5 million tonnes in terms of K_2O content as against 35 million tonnes in 2011. Canada remained the leading producer of potash with 28% share in total production in 2012, followed by Russia (17%), Belarus (15%), China (8%), Germany (10%), Israel (7%), and Jordan & Chile (3% each) (Table-4).

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

(In '000 tonnes of K_2O content)

Country	Reserves
World: Total (rounded)	**6072000**
Belarus	3300000
Brazil	300000
Canada	1000000
Chile	150000
China	210000
Germany	140000
Israel	40000
Jordan	40000
Russia	600000
Spain	20000
UK	22000
USA	200000
Other countries	50000

Source: *Mineral Commodity Summaries, 2014.*

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

(In '000 tonnes of K_2O content)

Country	2010	2011	2012
World: Total	**33000**	**35000**	**31500**
Belarus	5223	5306	4831
Canada (Chloride)	9788	11005	8963
Chile (Chloride)	961	864	1062
China	2344	2599	2559
Germany (Potassic salt)	3024	3215	3149
Israel (Chloride)	2041	1790	2115
Jordan	1285	1355	1094
Russia	6128	6526	5403
USA (Potassic salt)	930	1000	900(e)
Other countries	1276	1340	1424

Source: *World Mineral Production, 2008-2012.*

Table – 5 : Exports of Potash Fertilizers (By Countries)

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**32497**	**707275**	**13972**	**442706**
UAE	1995	58598	5438	161928
Sri Lanka	22590	404438	2256	67863
Egypt	1328	42496	1713	53597
Saudi Arabia	452	12116	1078	37492
Iran	277	7231	575	23068
Kuwait	++	10	750	21035
Iraq	-	-	661	17300
Lebanon	3	251	378	12372
Mozambique	-	-	357	10796
Peru	56	1562	224	7691
Other countries	5796	180573	542	29564

FOREIGN TRADE

Exports

Exports of potash fertilizer were 13,972 tonnes in 2012-13 as against 32,497 tonnes in the previous year. Exports were mainly to UAE (39%). Exports of potassium nitrate decreased marginally to 1,061 tonnes in 2012-13 from 1,320 tonnes in the previous year. Exports were mainly to Thailand, Nigeria, Malaysia and USA (Tables- 5 and 6).

Imports

Imports of potash fertilizer decreased to 2.12 million tonnes in 2012-13 from 2.84 million tonnes in the previous year. Russia (27%), Israel (25%), Belarus (15%), Canada (11%) and Jordan (10%) were the main suppliers in 2012-13. Imports of potassium nitrate decreased to 112 tonnes in 2012-13 from 219 tonnes in the previous year. Germany and China were the main suppliers of potassium nitrate in 2012-13 (Tables- 7 and 8).

Table – 6 : Exports of Potassium Nitrate (By Countries)

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**1320**	**88592**	**1061**	**74452**
Thailand	484	24430	339	23122
Nigeria	1	652	215	12792
Malaysia	62	3218	205	12444
USA	98	18596	106	11488
South Africa	11	2513	110	6516
UAE	117	7096	38	2733
France	++	12	22	2032
Pakistan	-	-	5	1313
Tanzania	++	1	13	1023
Reunion	-	-	8	324
Other countries	547	32074	++	665

Table – 7 : Imports of Potash Fertilizers (By Countries)

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**2842342**	**66003275**	**2122718**	**57194141**
Russia	488837	11705046	579407	15463618
Israel	679801	15015951	521119	13771378
Belarus	313074	7764692	317892	8426323
Canada	571946	13779334	236330	6735209
Jordan	329017	8031470	215299	6113362
Germany	100476	2482390	66126	1739448
Lithuania	38503	938592	57456	1473700
USA	18668	360572	40866	1049662
Bahrain	-	-	35061	820562
Latvia	200157	3491623	27061	733748
Other countries	101863	2433605	26101	867131

Table – 8 : Imports of Potassium Nitrate (By Countries)

Country	2011-12		2012-13	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**219**	**14955**	**112**	**33606**
Germany	1	283	71	24082
China	217	14076	27	3292
France	++	13	5	2254
Korea, Rep. of	-	-	2	944
USA	++	36	1	935
Netherlands	1	460	1	570
Italy	-	-	1	472
UAE	-	-	3	439
Switzerland	-	-	1	420
UK	-	-	++	190
Other countries	++	87	++	8