

64 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 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 1.4.2010 (Provisional) 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 K₂O 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. 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 Guneriin Kachchh district. In Himachal Pradesh, glauconite of hydrothermal origin is found in Kumla-Kathwararea 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 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 domestic consumption of potash increased to 896 thousand tonnes in 2009-10 in fertilizer industry from around 746 thousand tonnes in 2008-09 (Table-2). Apparent consumption of potash fertilizer was about 5 million tonnes in 2009-10 and it has remained static as compared to preceding year based on export-import data.

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**Table – 1 : Reserves/Resources of Potash as on 1.4.2010(P)
(By Grades/States)**

(In million tonnes)

Grade/State	Reserves Total (A)	Remaining resources			Total (B)	Total resources (A+B)
		Indicated STD332	Inferred STD333	Reconnaissance STD334		
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 : Reported Consumption of Potash Salt
2007-08 to 2009-10**

(In tonnes)

Industry	2007-08	2008-09(R)	2009-10(P)
All Industries	1092400	746400	896000
Fertilizer	1092400(9)	746400(9)	896000(9)

Figures rounded off.

Data collected on non-statutory basis.

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 8,500 million tonnes of K₂O content. It is located mainly in Canada, Russia, Belarus, Germany, Brazil, China, USA, Israel and Jordan (Table-3).

The world production of potash in 2009 was 20.7 million tonnes in terms of K₂O content as against 32.8 million tonnes in 2008. Canada remained the leading producer of potash with 21% share in total production in 2009, followed by Russia (18%), Belarus and Israel 12% each, China 10%, Germany (9%) and Jordan (6%) (Table-4).

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

(In '000 tonnes of K₂O content)

Country	Reserves
World: Total (rounded)	8500000
Belarus	750000
Brazil	300000
Canada	4400000
Chile	10000
China	200000
Germany	710000
Israel*	40000
Jordan*	40000
Russia	1800000
Spain	20000
Ukraine	25000
UK	22000
USA	90000
Other countries	50000

Source: Mineral Commodity Summaries, 2010.

*Total reserves in the Dead Sea are arbitrarily divided equally between Israel and Jordan.

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

(In '000 tonnes of K₂O content)

Country	2007	2008	2009
World: Total	34500	32800	20700
Belarus	4972	4967	2485
Canada (Chloride)	11426	10379	4318
China	1823	1980	2100
Germany (Potassic salt)	3637	3280	1825
Israel (Chloride)	2146	2134	2446
Jordan	1090	1200	1199
Russia	6373	5935	3691
USA (Potassic salt)	1100	1100	840°
Other Countries	1933	1825	1796

Source: World Mineral Production, 2005-2009.

Canada

About one-third of world potash production capacity is concentrated in Canada, also the leading world producer. Canadian Potash producers were Potash Corp. of Saskatchewan Inc. (PCS), Mosaic and Agrium Inc. PCS has plans to expand capacity by 4.55 million tpy K₂O by 2012-end. PCS also planned to open a mine and expand milling operation. Mosaic is also to expand capacity by 3.1 million tpy in phases from 2009 over the next decade. Agrium has plans for capacity expansion by 0.2 million tpy during 2011-12. Current project developments include - Burr project of Athabasca Potash Inc. and Legacy Project solution mine of Potash One Inc.

Congo (Brazzaville)

Mag Minerals Inc. obtained a mining near Pointe Noire Port licence for Kouiliou Potash mine. The mine with 1.2 millions tpy capacity will operate initially at 0.6 million tpy production rate. Congo Potash Ltd also planned to start production in the same region in 2013.

**Table – 5 : Exports of Potash fertilizers
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs.'000)
All Countries	41446	616524	29606	830878
Jordan	1	6	24000	540349
USA	93	4012	1220	191795
Sri Lanka	7967	165031	987	22945
Turkey	130	4254	228	14911
Mozambique	365	10879	708	13424
Malaysia	9334	152920	185	6877
Vietnam	1038	21148	125	2460
U A E	3956	57760	6	232
Iran	917	17414	++	7
China	8413	85183	-	-
Other countries	9232	97917	2147	37878

FOREIGN TRADE

Exports

Exports of potash fertilizer decreased to 29,606 tonnes in 2009-10 from 41,446 tonnes in the previous year. Exports were mainly to Jordan (81%) and USA (4%). Exports of potassium nitrate increased to 2,543 tonnes in 2009-10 from 836 tonnes in the previous year. Exports were mainly to Thailand, Malaysia and Australia. There were no exports of potassium salts (natural) in 2009-10 as compared to 10 tonnes in 2008-09 (Tables 5 to 7).

Imports

Imports of potash fertilizer increased marginally to 5.19 million tonnes in 2009-10 from 5.06 million tonnes in the previous year. Russia (18%), Canada (16%), Belarus (15%), Israel (14%), Jordan and Ukraine (10% each) were the main suppliers in 2009-10. Imports of potassium nitrate decreased to 530 tonnes in 2009-10 from 1,476 tonnes in the previous year. China was the main supplier of potassium nitrate in 2009-10 (Tables 8 and 9).

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs . '000)	Qty (t)	Value (Rs.'000)
All Countries	836	52168	2543	136932
Thailand	107	6516	1187	59070
Malaysia	260	15969	261	12054
Australia	++	53	190	9424
USA	24	4655	68	8948
Kenya	–	–	137	8312
Nigeria	26	1438	138	6409
Oman	–	–	90	4262
UAE	5	679	56	3231
Bangladesh	31	2312	50	2969
Indonesia	159	8363	48	2754
Other countries	224	12183	318	19499

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs . '000)	Qty (t)	Value (Rs.'000)
All Countries	10	783	—	—
Chinese Taipei/ Taiwan	10	783	—	—

**Table – 8 : Imports of Potash Fertilizers
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs . '000)	Qty (t)	Value (Rs.'000)
All Countries	5062896	131474703	5188833	120184457
Russia	1291974	35378969	925293	20787082
Canada	1077473	27898504	828068	19409250
Belarus	460238	10207703	771587	19280336
Israel	1031318	26920600	750445	17557539
Jordan	746551	18206695	527520	12471834
Ukraine	174710	5286384	523915	11397162
Latvia	34824	1055349	223195	4829501
Germany	131077	3047622	200945	4824925
UK	–	–	140366	3231009
Lithuania	65075	2062626	–	–
Other countries	49656	1410251	297499	6395819

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs . '000)	Qty (t)	Value (Rs.'000)
All Countries	1476	78868	530	43787
China	280	9970	456	39156
Israel	1032	59280	24	1580
Jordan	24	1773	24	1400
Poland	–	–	15	702
Germany	5	142	6	254
Netherlands	–	–	1	252
U S A	++	47	3	246
Italy	–	–	++	176
Chile	120	6717	1	21
UAE	15	926	–	–
Other countries	++	13	–	–