

POTASH



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**POTASH**

**(FINAL RELEASE)**

**GOVERNMENT OF INDIA  
MINISTRY OF MINES  
INDIAN BUREAU OF MINES**

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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 & 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 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. 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 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 Sirmour 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 being used as a raw material for manufacturing complex fertilizers.

## CONSUMPTION

Reported domestic consumption of potash decreased to 1.42 million tonnes in 2011-12 in fertilizer industry from around 1.88 million tonnes in 2010-11 (Table-2).

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

(In million tonnes)

| Grade/State              | Reserves<br>Total<br>(A) | Remaining resources |                    |                          | Total<br>(B) | Total<br>resources<br>(A+B) |
|--------------------------|--------------------------|---------------------|--------------------|--------------------------|--------------|-----------------------------|
|                          |                          | Indicated<br>STD332 | Inferred<br>STD333 | Reconnaissance<br>STD334 |              |                             |
| <b>All India : Total</b> | –                        | <b>18142</b>        | <b>3652</b>        | <b>22</b>                | <b>21816</b> | <b>21816</b>                |
| <b>By Grades</b>         |                          |                     |                    |                          |              |                             |
| Glaucanite               | –                        | 878                 | 1068               | 22                       | 1968         | 1968                        |
| Polyhalite               | –                        | 13985               | 2179               | –                        | 16164        | 16164                       |
| Sylvite                  | –                        | 2072                | 404                | –                        | 2476         | 2476                        |
| Unclassified             | –                        | 1206                | –                  | –                        | 1206         | 1206                        |
| <b>By States</b>         |                          |                     |                    |                          |              |                             |
| 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  
2009-10 to 2011-12**

(In tonnes)

| Industry              | 2009-10        | 2010-11(R)     | 2011-12(P)     |
|-----------------------|----------------|----------------|----------------|
| <b>All Industries</b> | <b>1209500</b> | <b>1884900</b> | <b>1421400</b> |
| Fertilizer            | 1209500(11)    | 1884900(11)    | 1421400(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 9,500 million tonnes of K<sub>2</sub>O content. It is located mainly in Canada, Russia, Belarus, Germany, Brazil, China, USA, Israel and Jordan (Table-3).

The world production of potash in 2011 was 35.1 million tonnes in terms of K<sub>2</sub>O content as against 33.0 million tonnes in 2010. Canada remained the leading producer of potash with 31% share in total production in 2011, followed by Russia (18%), Belarus (15%), China (7%), Germany (9%) and Israel & Jordan (6%) each (Table-4).

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

(In '000 tonnes of K<sub>2</sub>O content)

| Country                       | Reserves       |
|-------------------------------|----------------|
| <b>World: Total (rounded)</b> | <b>9500000</b> |
| Belarus                       | 750000         |
| Brazil                        | 300000         |
| Canada                        | 4400000        |
| Chile                         | 150000         |
| China                         | 210000         |
| Germany                       | 140000         |
| Israel                        | 40000          |
| Jordan                        | 40000          |
| Russia                        | 3300000        |
| Spain                         | 20000          |
| UK                            | 22000          |
| USA                           | 130000         |
| Other countries               | 50000          |

Source: Mineral Commodity Summaries, 2013.

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

(In '000 tonnes of K<sub>2</sub>O content)

| Country                 | 2009         | 2010         | 2011         |
|-------------------------|--------------|--------------|--------------|
| <b>World: Total</b>     | <b>20800</b> | <b>33000</b> | <b>35100</b> |
| Belarus                 | 2485         | 5223         | 5332         |
| Canada (Chloride)       | 4318         | 9788         | 11005        |
| Chile (Chloride)        | 713          | 961          | 864          |
| China                   | 2062         | 2344         | 2599         |
| Germany (Potassic salt) | 1825         | 3024         | 3215         |
| Israel (Chloride)       | 2446         | 2041         | 1790         |
| Jordan                  | 1199         | 1285         | 1355         |
| Russia                  | 3691         | 6128         | 6500         |
| USA (Potassic salt)     | 700          | 930          | 1100         |
| Other countries         | 1361         | 1276         | 1340         |

Source: World Mineral Production, 2007-2011.

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

| Country              | 2010-11      |                   | 2011-12      |                   |
|----------------------|--------------|-------------------|--------------|-------------------|
|                      | Qty<br>(t)   | Value<br>(₹ '000) | Qty<br>(t)   | Value<br>(₹ '000) |
| <b>All Countries</b> | <b>30180</b> | <b>599621</b>     | <b>32497</b> | <b>707275</b>     |
| Sri Lanka            | 23760        | 455150            | 22590        | 404438            |
| Pakistan             | 1389         | 29186             | 5187         | 143973            |
| UAE                  | 2454         | 56378             | 1995         | 58598             |
| Egypt                | 105          | 2862              | 1328         | 42496             |
| Saudi Arabia         | 301          | 9528              | 452          | 12116             |
| Israel               | -            | -                 | 15           | 8140              |
| Iran                 | 1620         | 29825             | 277          | 7231              |
| Malaysia             | 99           | 4284              | 241          | 6870              |
| Turkey               | 20           | 1203              | 60           | 3814              |
| Philippines          | 21           | 1149              | 3            | 2807              |
| Other countries      | 411          | 10056             | 349          | 16792             |

**FOREIGN TRADE**

**Exports**

Exports of potash fertilizer were 32,497 tonnes in 2011-12 as against 30,180 tonnes in the previous year. Exports were mainly to Sri Lanka (69%). Exports of potassium nitrate decreased to 1,320 tonnes in 2011-12 from 1,597 tonnes in the previous year. Exports were mainly to Thailand, USA and Malaysia. (Tables- 5 and 6).

**Imports**

Imports of potash fertilizer decreased to 2.84 million tonnes in 2011-12 from 4.61 million tonnes in the previous year. Israel (24%), Canada (20%), Russia (17%), Jordan and Belarus (11% each) were the main suppliers in 2011-12. Imports of potassium nitrate decreased to 219 tonnes in 2011-12 from 466 tonnes in the previous year. China was the main supplier of potassium nitrate in 2011-12 (Tables- 7 and 8).

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

| Country              | 2010-11     |                   | 2011-12     |                   |
|----------------------|-------------|-------------------|-------------|-------------------|
|                      | Qty<br>(t)  | Value<br>(₹ '000) | Qty<br>(t)  | Value<br>(₹ '000) |
| <b>All Countries</b> | <b>1597</b> | <b>103578</b>     | <b>1320</b> | <b>88592</b>      |
| Thailand             | 1069        | 48635             | 484         | 24430             |
| USA                  | 281         | 43167             | 98          | 18596             |
| Sri Lanka            | ++          | 3                 | 160         | 11094             |
| UAE                  | 14          | 990               | 117         | 7096              |
| Israel               | -           | -                 | 25          | 3233              |
| Malaysia             | 54          | 2257              | 62          | 3218              |
| South Africa         | -           | -                 | 11          | 2513              |
| Kenya                | -           | -                 | 49          | 2376              |
| Saudi Arabia         | 1           | 441               | 41          | 2179              |
| Unspecified          | ++          | 25                | 108         | 4282              |
| Other countries      | 178         | 8060              | 165         | 9575              |

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

| Country               | 2010-11        |                   | 2011-12        |                   |
|-----------------------|----------------|-------------------|----------------|-------------------|
|                       | Qty<br>(t)     | Value<br>(₹ '000) | Qty<br>(t)     | Value<br>(₹ '000) |
| <b>All Countries</b>  | <b>4617512</b> | <b>77338258</b>   | <b>2842342</b> | <b>66003275</b>   |
| Israel                | 834576         | 12507306          | 679801         | 15015951          |
| Canada                | 740224         | 12687321          | 571946         | 13779334          |
| Russia                | 848623         | 14397870          | 488837         | 11705046          |
| Jordan                | 593280         | 10338649          | 329017         | 8031470           |
| Belarus               | 464053         | 7906643           | 313074         | 7764692           |
| Latvia                | 418127         | 7099925           | 200157         | 3491623           |
| Germany               | 204852         | 3646490           | 100476         | 2482390           |
| Ukraine               | 108061         | 1790409           | 38499          | 945564            |
| Lithuania             | 38101          | 672147            | 38503          | 938592            |
| Chinese Taipei/Taiwan | 7303           | 217559            | 23003          | 592242            |
| Other countries       | 360312         | 6073939           | 59029          | 1256371           |

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

| Country              | 2010-11    |                   | 2011-12    |                   |
|----------------------|------------|-------------------|------------|-------------------|
|                      | Qty<br>(t) | Value<br>(₹ '000) | Qty<br>(t) | Value<br>(₹ '000) |
| <b>All Countries</b> | <b>466</b> | <b>22620</b>      | <b>219</b> | <b>14955</b>      |
| China                | 175        | 7157              | 217        | 14076             |
| Netherlands          | 1          | 248               | 1          | 460               |
| Germany              | 2          | 83                | 1          | 283               |
| Singapore            | -          | -                 | ++         | 70                |
| USA                  | ++         | 1                 | ++         | 36                |
| France               | -          | -                 | ++         | 13                |
| Other countries      | 288        | 15131             | ++         | 17                |