

Performance and Evaluation of *Saumic Suvrushti* Project in India*

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Abstract

Agricultural production in India solely depends upon the monsoon rainfall. Its timely onset, spread over the country, and distribution are important factors that contribute to the production of agricultural crops. Drought affects the agricultural production adversely. Rainfall prediction by modern as well as astro-meteorological techniques is important in planning the agricultural production. Monsoon cycle is disturbed due to many natural as well as anthropogenic reasons. The Vedas propose the uncommon remedy of performance of somayagas for balancing the six ritus (seasons). In the present study the performance of different types of somayagas at 16 places including 12 Jyotirlingas were carried out prior to start of monsoon and also during the period of monsoon. Data on actual rainfall that occurred were evaluated at 16 places as well as in the country and states like Maharashtra and Gujarat. For the country as a whole monsoon rainfall was 99% of long period average (LPA) whereas the region of Central India received 17% above normal rainfall. Maharashtra recorded 14% above normal rainfall while Gujarat received 51% above normal rainfall. Nakshatra-wise rainfall at most of the places revealed well distributed and above normal rainfall. There was early onset of monsoon by 7 days and late withdrawal by 20 days in Maharashtra. Increase in water table was evident in some of the districts of Maharashtra. All the water reservoirs and dams were overflowing during monsoon 2006. Negative impact was observed for very heavy rainfall and floods in some rivers and places.

Agricultural production in India mainly depends upon the monsoon rainfall. Its timely onset, spread over the country, and distribution

along with dry spell and wet spell are important factors that contribute to the production of agricultural crops in general and

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kharif (rainy season) crops in particular. The progress of agricultural growth is alarmingly slow, at 2.3% during 2005–06, when national economy is growing at 8.1%. During the 1990s, agriculture recorded a growth of 4.7% per year which declined to 2.1% in the IXth plan period, and further decreased to 1.5% in 2006 (Chandra Babu, 2006). During the past forty years of adoption of green revolution technology (1962–63 to 2003–04) food production increased from 82 million t to 200 million t per annum (Singh, 2006). Agriculture plays the most important role in Indian economy. The annual agricultural production decides the gross domestic product (GDP) of the country, directly as well as indirectly. Share of agriculture in GDP is 23%, industries 27%, and services sector 50% (Varshneya, 2007). However, industries and services sector are influenced by agricultural sector. More than 90% of food consumed in India is produced locally; the efficiency of production has to be improved for the well-being of the poor, through the use of appropriate technologies. The rural poverty was lowest (4.7%) in Jammu and Kashmir while it was highest at 44% in Bihar during 1999–2000. On all India basis rural poverty was 39.4% in 1987–88, 37.1% in 1993–94, and 26.8% in 1999–2000. The total irrigated area in India is around 32% and it cannot exceed more than 50% even after interlinking all rivers in the country.

Therefore, major thrust for increasing agricultural production should be on the prediction of rainfall at all time and spatial scale. In the northern part of Australia, in the grain belt, significant increase in profit up to 20% and reduction in risk up to 35% can be achieved in wheat-based cropping

system, if seasonal rainfall forecast is available (Varshneya, 2007).

The timely onset, well distributed, and sufficient monsoon rainfall is the key for better agricultural production in the country which directly influences rural poverty alleviation. The extreme events like floods and droughts affect the agricultural production and finally the nation's economy. During the drought year of 2002, though there was not much change in technology, food grain production reduced to 183 million t from 213 million t recorded during better year of 2001. Due to this, the Government of India has to review the monsoon forecasting model based on 16 parameters and from 2003, India Meteorological Department (IMD) has been giving rainfall prediction based on 8 parameters and updates their forecast in July by using two additional parameters.

IMD's long range forecast

There is lot of spatial as well as temporal variation in rainfall observed in India. There are various methods, modern as well as traditional, for prediction of rainfall. Modern method of long range prediction is based on 16 parameters, which IMD was using from 1988 to 2002. Then it was updated to 10-parameter model in two stages of prediction, i.e., first stage of forecast is issued in April by using 8 parameters and second stage of forecast is issued in July by using another two parameters (Varshneya, 2007).

The eight parameters used in the Power Regression Model are:

1. Arabian Sea Surface Temperature (January + February)

2. Eurasian Snow Cover (December of previous year)
3. Northwest Europe Mean Temperature (January)
4. Nino-3 SST (July + August + September of previous year)
5. South Indian Ocean SST Index (March)
6. East Asia Pressure (February + March)
7. Europe Pressure Gradient (January)
8. 50 hPa Wind Pattern (January + February)

The Probabilistic Model estimates the probability of Southwest Monsoon season (June–September) rainfall for the country as a whole in five predefined categories:

1. Deficient [less than 90% of long period average (LPA)]
2. Below normal (90 to 98% of LPA)
3. Near normal (98 to 102% of LPA)
4. Above normal (102 to 110% of LPA)
5. Excess rainfall (more than 110% of LPA)

Medium range weather forecast

The National Centre for Medium Range Weather Forecasting (NCMRWF), New Delhi is predicting location-specific rainfall and five other parameters for four days twice a week. NCMRWF is giving prediction based on Numerical Weather Prediction (NWP) technique with the help

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of super computer to 107 Agromet Advisory Field Units (AMFU) throughout the country. The average accuracy of rainfall forecast on Yes/No basis was 70% for Pune in Maharashtra and 68–76% for Anand in Gujarat in monsoon season (Varshneya, 2007).

Traditional techniques of rainfall forecasting

The traditional technique of rainfall prediction gives *nakshatra*-wise rainfall prediction in almanacs; for example, Date Panchang from Solapur has been publishing *nakshatra*-wise rainfall forecast since last 40 years. *Nakshatra Varsha* almanac for Maharashtra was prepared by Varshneya *et al.* (2002) and daily rainfall forecast was published for five regions of the state, viz., Vidarbha, Marathwada, Khandesh, Western Maharashtra, and Konkan region. The calendar is prepared well in advance (in November) for the ensuing monsoon season. Vaidya (2004) elaborates the relative advantage of this almanac for Maharashtra.

In Gujarat for the first time *nakshatra-charan*-wise forecast of rainfall was given by Anand Agricultural University (AAU), Anand for 2005 for eight agroclimatic zones of Gujarat. The validation of this forecast on Yes/No basis indicated that accuracy ranged between 42% and 73% for various zones during 2005. Then AAU prepared “Monsoon Research Almanac–2006” and published daily rainfall forecast for eight agroclimatic zones of Gujarat (Varshneya *et al.*, 2006). Validation of rainfall forecast

on Yes/No basis indicates that average accuracy of rainfall forecast for the state as a whole ranged between 40.4% and 62.5%. The various astrological methods and techniques for rainfall prediction have been discussed in great detail by Varshneya and Vaidya (2002) and Bhat *et al.* (2005).

The 1st World Congress on Vedic Sciences was held in Bangalore during 9–13 August 2004 in which a new topic on “Rain induction through the Vedic technology” was presented by Kale *et al.* (2005). This paper elaborated the study of 19 + 11 ‘*Nitya*’ and 20 + 5 *Naimittika Parjanya Yag* performance during 1981–2003 by Shri Yogiraj Ved Vijnan Ashram, Barshi, Solapur district, Maharashtra. The overall success was about 80% in achieving the objective of the *Parjanya Yag* (Kale *et al.*, 2005). These *Parjanya Yagas* were done in Maharashtra, Gujarat, Madhya Pradesh, Kerala, Orissa, Andhra Pradesh, and Tamil Nadu. During 2004, *Parjanya Yag* was performed at 13 places in Maharashtra and Kerala. All places except Akola in Vidarbha have recorded good and well distributed rainfall from *Rohini* to *Swati nakshatra* (Kale *et al.*, 2004). During 2005, *Nitya Varunyoga Parjanya Yag* was performed from 6 to 10 April 2005 at 14 locations. These *Parjanya Yagas* gave positive results. The Ved Vijnan Ashram later performed two *somayagas* in Madhya Pradesh and 14 *Nitya Varuna Yagas* in Maharashtra. These gave very good results as there was very good and well distributed rainfall observed in all *nakshatras* at these 14 locations.

Background of performance of 16 *somayagas*

In the summer of 1950, when the first president of India Dr Babu Rajendra Prasad came to “Panchmadhi” in Madhya Pradesh, the primary teacher of the school presented his research paper on “Twelve *Jyotirlingas*”. His findings indicated that 12 *Jyotirlingas* are originally “Holy Fire Places”, which are supposed to be the centers that attract and accelerate the monsoon cycle in *Bharat Khand*. India, Pakistan, East Africa, Madagascar, West Indies, South America, Bangladesh, Thailand, Myanmar, Philippines, Sri Lanka, and North Australia get rains from the monsoon. Late and weak monsoon occurrence very badly affects these countries (Anonymous, 2006a).

If the series of *yajna* performance is undertaken before monsoon activates, “*Bharatvarsh*” will get timely and sufficient “monsoon rains”. K Sudarshan of Rashtriya Swayamsevak Sangh (RSS) inspired Shri Yogiraj Ved Vijnan Ashram, Barshi to undertake “*Saumic Suvrushti*” project with full support by scientific methods and evaluate results obtained. Sudarshan personally made the *Mahasankalpa* of 16 *somayagas* to be performed in this “*Saumic Suvrushti*” project at Yogiraj Ved Vijnan Ashram and appointed Dixit Ketan Kale as *Yajaman* for first *Vajapeya Somayag*. In this project *Vajapeya* was successfully performed from 9 to 16 November 2005.

India has been experiencing floods in one part and dry spells in the other part of the country. Untimely and uncertain rains have

become a common feature of the seasons. Natural cycle of seasons has been disturbed by the human race itself through widespread pollution. Vedas recommend “Uncommon remedy” of “*somayag*” to overcome such disasters. So, this “Project *Somayag*” is proposed to balance the seasons and timely and sufficient monsoon rains in the rainy season of 2006. The *somayagas* were planned at 16 places consisting of 12 *Jyotirlinga* places and 4 other places in India and were performed during November 2005 to August 2006 (Table 1).

Other than *Jyotirlinga* places such as Trivandrum, Ranchi, Rajkot, and Barshi are located on the “Tough Line” of cloud travel, which is supposed to be the highway from sea to inner land. These 16 *somayag* places and dates of their performances were fixed with consultation and approval of “Meteorological Advisory Committee” and traditional Astro-meteorologists related with the Ashram and *Shrout Yajna* experts.

These *somayag* performance dates are the days of rain conception and it will give the

Table 1. *Somayagas* performed at 16 places in India for monsoon rain.

Place of <i>somayag</i>	Date	Type of <i>somayag</i>	Rainfall (mm) (1 May to 31 Dec 2006)
Barshi ¹ (Maharashtra)	9–16 Nov 2005	<i>Vajpeya</i>	692.1
Parali-Vajinath (Maharashtra)	9–20 Nov 2005	<i>Vajpeya</i>	790.0
Trivandrum ¹ (Kerala)	28 Nov to 2 Dec 2005	<i>Atyagnishtom</i>	1712.7
Dwarka (Gujarat)	30 Dec 2005 to 4 Jan 2006	<i>Atyagnishtom</i>	641.9
Rajkot ¹ (Gujarat)	25–30 Jan 2006	<i>Sarvatomukh-Kathak</i> <i>Chayan-saha</i>	1919.2
Somnath (Gujarat)	22–28 Feb 2006	<i>Some-purva Adhan</i> <i>Agnishtom</i>	845.2
Ujjain (Madhya Pradesh)	27 Feb to 4 Mar 2006	<i>Shodashi</i>	1987.0
Omkareshwar (Madhya Pradesh)	14 to 19 Mar 2006	<i>Atiratra</i>	892.0
Ranchi ¹ (Jharkhand)	9–14 April 2006	<i>Aptoryam</i>	1499.0
Rameshwaram (Tamil Nadu)	9–13 May 2006	<i>Some-purva Adhan</i> <i>Agnishtom</i>	702.0
Varanasi (Uttar Pradesh)	21–26 Jun 2006	<i>Atyagnishtom</i>	638.0
Srisailam (Andhra Pradesh)	21–26 Jun 2006	<i>Some-purva Adhan</i> <i>Agnishtom</i>	669.0
Badri Kedarnath (Uttarakhand)	11–15 Jul 2006	<i>Shodashi</i>	NA ²
Ghrushneshwar (Maharashtra)	25–30 Jul 2006	<i>Atiratra</i>	959.2
Tryambakeshwar (Maharashtra)	5–10 Aug 2006	<i>Atyagnishtom</i>	887.0
Bhimashankar (Maharashtra)	5–10 Aug 2006	<i>Shodashi</i>	6316.0

1. Other than *Jyotirlinga* places.

2. NA = Data not available.

delivery of rain after 193–195 days according to Brihat Samhita of Varahamihira (505–587 AD). This period naturally is in the rainy season, i.e., June to October 2006.

Importance of *somayag*

Caught in interlocking meshes for modernity and materialism, the Indian psyche is coasting towards insecurity and dissatisfaction. The ecological balance has been disturbed by the human quest for material value. Now is the time to return to tradition and bring about a renaissance of age-old Indian rituals. *Somayagas* were originally performed for the rejuvenation of nature and mankind. *Shrout* (Vedic) *somayagas* awaken and accelerate the cosmic, *satvik* (virtuous), and subtle energies which create the healthy atmosphere for the survival and growth of life on earth.

Somayag is the offering of Soma Elixir to appease the six *Ritu Devatas* (energies), in order to redress the balance of the six seasons which seems to be in chaotic disarray. In *somayag*, Soma juice oblation is given to Lord Indra, who showers good rains on earth, and rains are the source of life on earth. *Somayag* is believed to strengthen the five elements or *Pancha*

Mahabhutas – *Pruthvi* (earth), *Ap* (water), *Agni* (fire), *Vayu* (wind), and *Akash* (sky) – in order to bestow prosperity and restore natural equilibrium. Prof. Dr Fritz Stall (Berkley University, USA) says in his ‘*Agni*’ book: “When we think of Vedic *somayag* rituals, we stand in awe of this unique survival, so archaic yet so sophisticated, so close to early history of man and so lovingly preserved through millennia that elsewhere saw the birth and death of entire civilizations. While pyramids, temples, cathedrals and sky-scrapers were built and fell into decay, languages and religions came and went, and innumerable wars were fought and are still going on, the Vedas and their ritual continued to be transmitted by word of mouth from teacher to pupil, from father to son. What a triumph of the human spirit over the limitations of matter and physical body! A continuity verging on immortality though not of individual person, and so we found ourselves involved not merely in past, but present and future as well.” So, for the welfare of the whole creation, we as followers of Vedic culture must perform *somayagas* (Anonymous, 2006a).

Ancient tradition of *somayagas*

Vedas are the oldest literature of humanity. The UNESCO has declared that “An oral

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tradition of Vedas is intangible heritage of humanity.” Vedas originally proposed *Shrout somayagas* performed on three fires. From Vedic period till the present time *Shrout somayagas* are traditionally performed all over India.

References of *somayagas*

- All *Devas* performed *Ashwamedha* to strengthen creator of Universe, i.e., *Prajapati* (Taittiriya Brahman 5.4.12).
- *Rishi* Angiras performed *Shrout yajna* for immediate rains to subside the drought period and get healthy grass for cattle.
- The father of Seer Nachiketa performed *Vishwajit Atiratra* (Kathakopanishad).
- “*Raja va esh yajnanam aswamedh*” (Shatapath Brahman 13.2.9.2), i.e., *Ashwamedha* is supreme King among all *Shrout yajnas*.
- “*Shree r vai rashtram ashwamedh*” (Shatapath Brahman 13.2.2.1), i.e., *Ashwamedha* should be performed for prosperity of nation.
- *Prabhu* Shriramchandra performed *Ashwamedha* (Ramayan).
- King Bali performed *Rajasuya* (Ramayan).
- Raja Harishchandra and Dharmaraja of Pandavas performed *Rajasuya* and *Ashwamedha* (Mahabharata).
- King Janamejaya and Pushyamitra performed *Ashwamedha* in the period of 1 to 7 AD. King Shatakarni, King Bharashiva, Samrat Samudragupta and many others performed *Ashwamedha* and other *Shrout yajnas* for good rains and prosperity in all places of the nation.

- King Jayachandra of Kanauj (1170 AD) performed *Rajasuya* and Queen Naganika performed *Ashwamedha*.

Results of 16 *somayagas*

The total rainfall recorded at the places where *somayag* was performed was above normal. Table 1 indicates that there was well distributed and above normal rainfall at majority of places. Besides this, in India as a whole actual rainfall that occurred was 99% of LPA and was more than predicted rainfall of 93% (Anonymous, 2006b).

Actual status of monsoon in 2006

According to IMD, in 2006 though 99% of rainfall occurred in India as a whole (June–September), the regions like Central India got 16% excess rainfall and it was deficient by 17% over Northeast India. Of the 36 meteorological subdivisions, the seasonal rainfall was excess in 6, normal (–19 to +19%) in 20, and deficient (<–19%) in 10 subdivisions. Of the 533 meteorological districts, 60% districts received excess/normal rainfall and remaining 40% districts received deficient/scanty rain. The 130 districts experienced moderate drought and 30 districts experienced severe drought. The following subdivisions have recorded more than normal rainfall (>10% of LPA) during 1 to 27 June 2006:

West Rajasthan 27%; Saurashtra and Kutch 45%; Gujarat 57%; Madhya Pradesh 60%; West Madhya Pradesh 18%; East Rajasthan 11%; Jammu and Kashmir 33%; Jharkhand 12%; West Bengal 19%; Orissa 31%; and Telangana 10%.

The somayagas were planned at 16 places consisting of 12 Jyotirlinga places and 4 other places in India and were performed during November 2005 to August 2006.

Onset of monsoon

In 2006 monsoon arrived over Kerala on 26th May, almost a week prior to normal date. It covered western parts of peninsular India and Northeast India by 6th June. The advance along west coast was rapid. But there was prolonged hiatus (break) from 7 to 22 June caused by intrusion of mid latitude westerly. By the end of June, monsoon covered entire Gujarat state, East Rajasthan, North Arabian Sea, and West Madhya Pradesh. Monsoon covered entire country on 24th July with a delay of 9 days.

Rainfall status in Gujarat

Seasonal rainfall in 2006 monsoon was 699.0 mm, which was 62.6% more than rainfall predicted by IMD (437.7 mm, which is 91% of LPA predictions) in Saurashtra and Kutch subdivision, whereas in Gujarat region rainfall recorded was 1446.6 mm, which is 58.1% more than rainfall predicted by IMD (840.8 mm). Average rainfall recorded in Gujarat state in Southwest monsoon season was 51% more than normal indicating that 2006 was an exceptional year in which dry areas of Saurashtra and Kutch also recorded more than average rainfall.

Of the 25 districts of Gujarat, four districts, viz., Junagadh, Bharuch, Valsad, and Dang

recorded normal (+19 to –19%) rainfall during June to September 2006, while all 21 districts recorded excess rainfall (Fig. 1). Except Dang district (–5.5%), all 24 districts have recorded more than normal rainfall, and highest above normal rainfall was recorded (+190.6%) in Banaskantha district. In Gujarat three *somayagas* have been performed; first at Dwarka during 30 December 2005 to 4 January 2006, second at Rajkot during 25–30 January 2006, and third at Somnath during 22 to 28 February 2006. At Rajkot in Saurashtra, the *Sarvatomukh somayag* is performed which is very influential in affecting all four directions of *yajna*. In 2006 about 60% more rainfall than normal was received in Saurashtra and Kutch subdivision. Rajkot district recorded 61.2% more rainfall than normal while Somnath received normal rainfall and Dwarka in Porbandar district recorded 63% more than normal rainfall.

Rainfall status in Maharashtra

In Maharashtra there are four *Jyotirlingas*, viz., Bhimashankar in Pune district, Parali-

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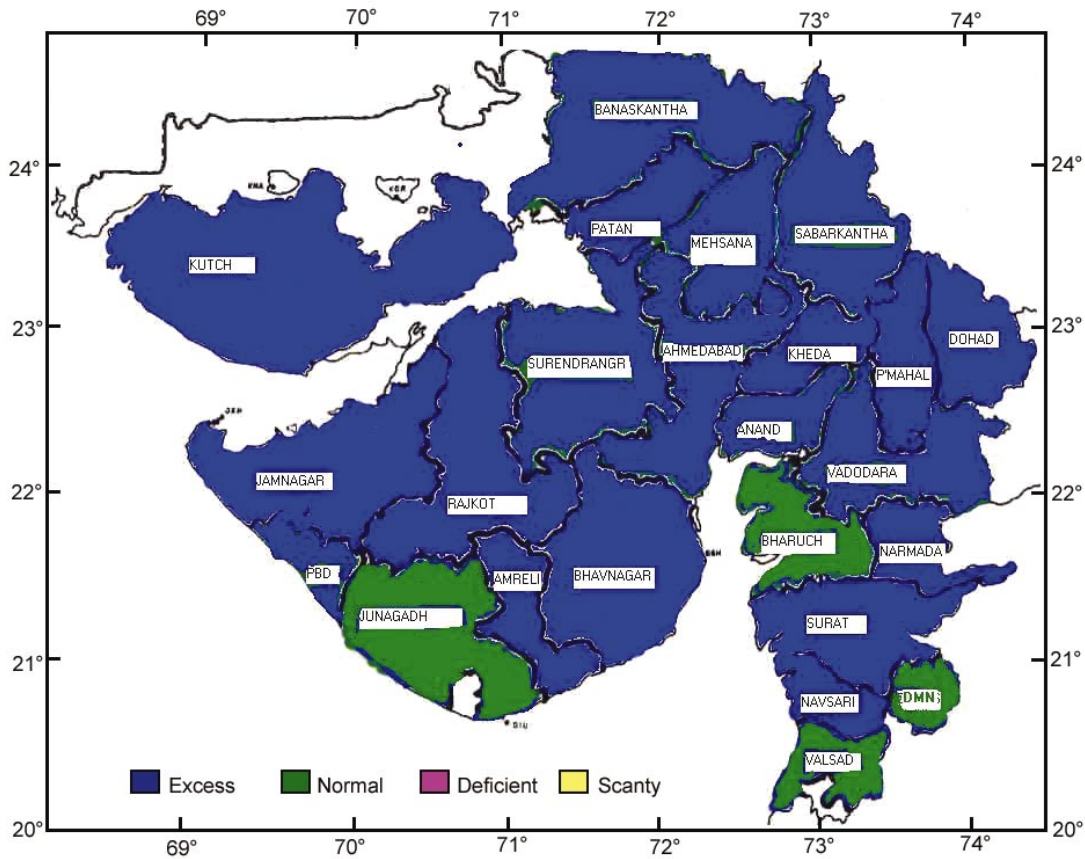


Figure 1. Seasonal rainfall for Gujarat state during 1 June to 20 September 2006.

Vaijnath in Bid district, Gruhshneshwar in Aurangabad, and Tryambakeshwar in Nasik district and the fifth non-*Jyotirlinga* place is Shri Yogiraj Ved Vijnan Ashram, Barshi in Solapur district where *Mahasankalpa* of 16 *yagas* was made on 9 November 2005. Maharashtra received 14% more rainfall than normal. Konkan and Goa received 7.2% more rainfall, Madhya Maharashtra received 59.8% more rainfall, Marathwada received 3.5% more rainfall, and Vidarbha received 8.8% more rainfall than normal. During 2005, Jalgaon (-24%) and Buldhana district (-26%) recorded deficit rainfall. But

during 2006 only one district, i.e., Nanded (-25%) recorded deficit rainfall (Fig. 2). Thirteen districts recorded excess (i.e., +20% or more) and 18 districts recorded normal (-19 to +19%) rainfall during 2006. Taluka-wise rainfall distribution indicates that there was more than 120% rainfall in 14 talukas in Konkan region, 39 talukas in Nasik region, 31 talukas in Pune region, and all talukas in Aurangabad, Latur, Amravati, and Nagpur region (which covers whole of Marathwada and Vidarbha region) whereas remaining 17 talukas of Konkan, 17 talukas of Nasik, and 5 talukas of Pune region

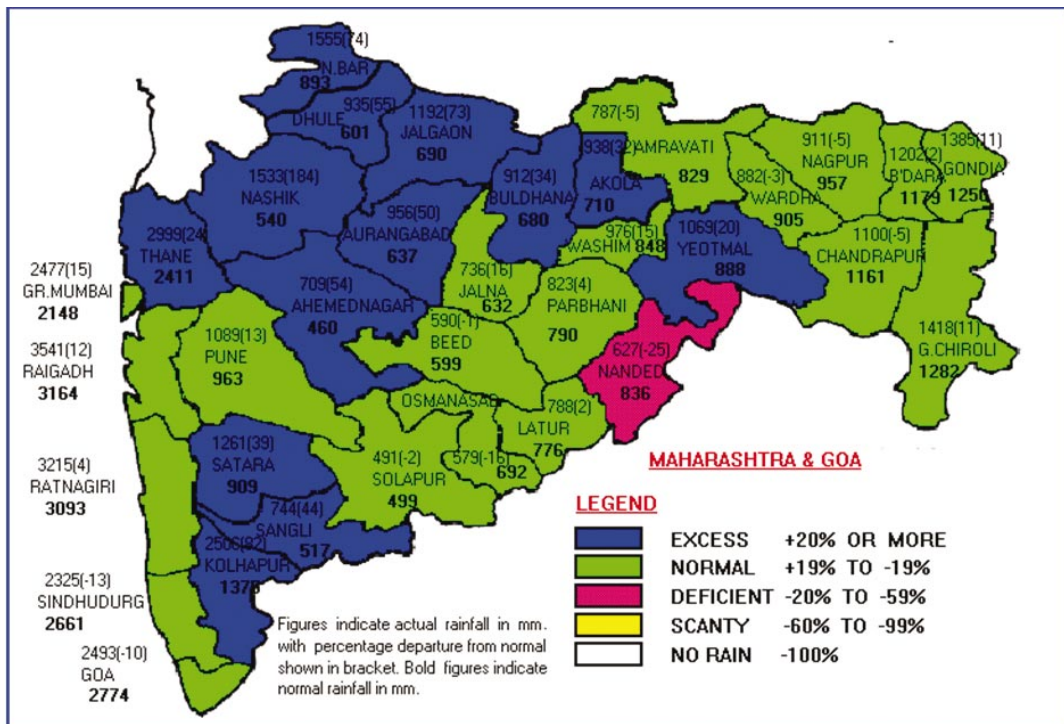


Figure 2. District-wise seasonal rainfall for Maharashtra state during 1 June to 30 September 2006 (Source: Regional Meteorological Centre, Colaba, Mumbai, India).

received 100–120% rainfall. In Maharashtra all talukas have received above normal rainfall which shows that 2006 is a very exceptional year because in every year some or other part of the state will always record less than normal rainfall (slight to moderate drought) situation.

Concluding highlights of *somayagas*

- For the first time 16 *somayagas* (including 12 *Jyotirlingas*) were performed for *Suvrushi*.
- Southwest monsoon arrives 7 days earlier than normal date.
- Monsoon withdraws from Maharashtra around 20 days later than the normal date.
- Rainfall was observed from *Rohini* to *Anuradha* constellation in some states; e.g., Maharashtra.
- Though IMD predicted 93% rainfall, in Maharashtra actual rainfall was around 100–120% of normal rainfall.
- There are 5 places of *somayag* (includes 4 *Jyotirlingas*) in Maharashtra; it was observed that there was highest rainfall in *Pushya nakshatra* (20 July to 2 August 2006).
- National Climate Centre declares that there is increase in rainfall in Maharashtra during three years, i.e., 2004, 2005, and 2006, showing increasing trend in rainfall.
- Rainfall conception and rainfall delivery dates matched as per Brihat Samhita;

average accuracy of 80% is observed at all places.

- All the dams and water reservoirs were overflowing during 2006.
- Timely sowing of *kharif* and *rabi* (postrainy season) crops was carried out in Maharashtra and other adjoining states.
- There is growth in agricultural production.
- Groundwater level has risen in several places; e.g., Jalgaon district in Maharashtra. In all the 15 talukas of Jalgaon district, there was increase in water table by 4–18 feet.

Special observation

Calamities such as floods in rivers and very heavy rainfall were observed. According to our understanding it may be due to late performance of *somayag* at certain places due to financial and administrative constraints.

Appeal

These *somayagas* have been performed to evaluate *Saumic* Rain Induction Technology integrating modern science. We seek help from all the interested people who believe in Vedas in the context of today's science.

References

Anonymous. 2006a. Saumic Suvrushti Project. A booklet published by Shri Yogiraj Ved Vijnan Ashram, Kasarvadi, Barshi, Maharashtra, India. 88 pp.

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Anonymous. 2006b. Southwest Monsoon-2006 End-of-Season Report published by India Meteorological Department. (www.imd.gov.in)

Bhat VV, Vaidya VB, and Joshi RM. 2005. Indian technology for rain prediction and water management. In: Agricultural Heritage of India: Proceedings of the International Conference on Agricultural Heritage of Asia held from 6 to 8 December 2004 at ANGRAU, Hyderabad, India (Nene YL, ed.). Asian Agri-History Foundation, Secunderabad, India. pp. 137–146.

Chandra Babu S. 2006. Two pronged policy needed. In: The Hindu Survey of Indian Agriculture–2006. The Hindu, Chennai, Tamil Nadu, India. pp. 18–23.

Kale Ketan, Venugopal T, Vaidya VB, and Mrigendra Vinod. 2004. Rain Induction Through Vedic Technology. A booklet published by Shri Yogiraj Ved Vijnan Ashram, Kasarvadi, Barshi, Maharashtra, India. 16 pp.

Kale Ketan, Venugopal T, Vaidya VB, and Mrigendra Vinod. 2005. Rain induction through Vedic technology. In: Proceedings of 1st World Congress on Vedic Sciences during 9–13 August 2004 at Bangalore (Krishnamurthy BL and Vasu KI, eds.). Vijnana Bharati, Bangalore, India. pp. 56–59.

Singh AK. 2006. Mantra for new millennium. In: The Hindu Survey of Indian Agriculture–2006. The Hindu, Chennai, Tamil Nadu, India. pp. 32–40.

Vaidya VB. 2004. Long range forecast of monsoon with astronomy and local observations for Maharashtra. Asian Agri-History 8(4):323–324.

Varshneya MC. 2007. Climate and weather forecast for agriculture. A lecture delivered at Indian Science Congress held at Chidambaram, Tamil Nadu, India on 6 January 2007. (www.aau.in)

Varshneya MC, Bhat VV, and Joshi RM. 2002. *Nakshatra-varsha* Almanac Prepared for Maharashtra. Shri Vijay V Bhat, Pune, Maharashtra, India. 22 pp.

Varshneya MC, Shekh AM, Pandey V, and Patel HR. 2006. Monsoon Research Almanac Prepared

for Gujarat. Anand Agricultural University, Anand, Gujarat, India. 25 pp.

Varshneya MC and Vaidya VB. (Eds.) 2002. Proceedings of Seminar on Prediction of Rainfall Based on Astrological Methods and Local Practices, 2 February 2002, Centre of Advanced Studies in Agricultural Meteorology (CASAM), Pune, India. MPKV/RES Publication No. 39. Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India. 112 pp.