Arsenic Contamination of Groundwater Signals Disaster!

O far from the available data, all arsenic affected areas of West Bengal are lying on the sediment of Younger Deltaic Deposition (YDD). The same sediment extended eastward towards Bangladesh covering the approximate area of 34 districts (Map-1) out of its total 64 districts. The area and population of these 34 districts are 65000 sq. km. and 51 million while the total area and population of Bangladesh are 148393 sq. km. 110 million respectively. We suspect groundwater of these 34 districts of Bangladesh may be arsenic contaminated. So far from 28 districts out of 34 we have collected 3106 water samples: 58 % water samples are unsuitable for drinking according to WHO recommended value (0.01 mg/l) and 38% samples contains arsenic above maximum permissible limit (0.05 mg/l). Out of these 28 district (Map-2) only in one district (Dhaka) one out of 177 water samples analysed contain arsenic above 0.05 mg/1 but 16 contains arsenic between 00.01-0.049 mg/1. Other than these 34 districts we have also analyzed 321 water samples from nine districts where we do not expect groundwater to be arsenic contaminated we have found that groundwater of all these nine districts is so far safe for drinking (Map-2). The area and population of 27 districts where we have found arsenic above 0.05 mg/1 is 51,000 sq. km. and 36 million respectively. So far water samples

16.7 million respectively. Out of these 34 districts suspected to be arsenic contaminated, so far we have surveyed 20 districts for arsenic patients and in 18 districts (Map-3) we have identified melanosis, leuco-melanosis, keratosis, hyperkeratosis, dorsum, non-petting oedema. gangrene, skin cancer, During our preliminary field survey in arsenic affected 45 villages in 18 districts we have at random examined 1630 people including children and found 57.5% of them with arsenical skinlesions. We have analysed a total of 2200 hair. nails. skinscale, urine samples from the patients and people living in the affected area and found 91% of them in average containing arsenic above permissible limit in human body. While comparing West Bengal arsenic scenario with the available data of Bangladesh it appears that the latter's arsenic calamity is more severe. If our prediction that groundwater in 34 districts of Bangladesh would be arsenic contaminated comes true then more than 50 million people would be at risk. To combat the situation, Bangladesh needs proper utilization of its vast surface and water resources. Proper watershed management is required urgently.

were analysed from 88 thanas

(Blocks) of these 27 districts

and in ground water of 72

thanas we have found arsenic above 0.05 mg/1. Total area

and population of these 72

thanas are 23,423 sq. km. and

Joint Venture to Study Arsenic Problem in Bangladesh

Although Bangladesh officials showed their eagerness to solve the problem but till December, 1996 progress was not as expected. From the patients who came for treatment to Calcutta we received water samples of their villages and collected their hair, nail and urine. The results indicated high concentration of arsenic in the analysed samples. In the mean time, during middle of 1996, four geologists from Rajshahi University came to our laboratory with 600 water samples and some hair and nails to asses arsenic problem of some districts in Bangladesh. The analytical results indicated high arsenic in water in some districts; also in hair and nails. Thus we are convinced about the seriousness of the problem. After Rajshahi University came to NIPSOM-Dhaka for a training at SOES sponsored by World

Organization -Bangladesh, and analysed some hair, nail and acquired water samples of the affected population. During August, 1996 one research student of SOES Mr. Ratan Kumar Dhar went to Bangladesh and worked jointly with NIPSOM -Dhaka and water samples from 19 districts and identified arsenic patients (including our previous patients) from 14 districts. The scholar stayed in Bangladesh for 3 months. There after came a medical team from Dhaka Community Hospital to discuss with us how we can jointly work for the arsenic problem of Bangladesh. SOES extended hands to Dhaka Community Hospital and a survey was made from December 19,1996 to January 7, 1997 and covered almost 15 districts. The joint work collected 2200 water samples, 700 each hair, nails and skin-scales and 200 urine samples. they identified about 700 arsenic patients from 35

arsenic affected villages.
Out of 36000 water samples so far we have analysed for arsenic. From 8 arsenic affected districts of West Bengal, only 30 samples contained arsenic above 1.0 mg/1. But out of 3106 water samples we have analysed from 28 out of 34 suspected arsenic affected districts in Bangladesh, 46 water samples contained arsenic above 1.0 mg/1. Higher concentration of arsenic is more abundant in

hair, nail and urine. These people may not show arsenical skin manifestation but they are sub-clinically affected.

Sufferings of People

Out of the 27 districts where we have found arsenic in groundwater above 0.05 mg/1, in 20 districts so far we have made preliminary survey for arsenic patients and in 18 districts we have identified people suffering from arsenical skin lesions. During our total field survey in 45 arsenic affected villages in 18 districts, we had at random examined 1630 people including children and out of that, 57.5% had arsenical skin lesions. From December 19, 1996 to January 6, 1997 in collaboration with Dhaka Community Hospital, we had surveyed 15 districts and out of that in 14 districts we have 662 persons identified (excluding children) having arsenical skin lesions and by random survey 1114 persons in arsenic affected villages. Out of these 15 districts we had surveyed, in 4 districts -Rajbari, Gopalgonj, Khulna and Magura - we had no previous information about people suffering from arsenicosis but we have identified patients from 3 districts which we have suspected.

In this survey, DCH-SOES team has covered a few arsenic affected villages in each district and got information of other villages and thanas. Sometimes

to depart leaving many patients

From our 21 days experience we

feel that 10-15 percentage of the

total people really suffering

came to us for tests. This is due

lation did not turn up medical

(1) Still in villages the affected

people think their disease

is contiguous and if other

people knew about their

ailment they would be

Young girls do not want to

come out. The obvious

reason: it will be difficult

to get married if the

In the rural areas, young

People are frustrated and

solution to their disease.

Since village roads are

not good, people who are

suffering do not want to

travel a long distance due

that young affected people

we were in

Pabna: The

during day time

they feel that there's no

Muslim women do not

villagers knew it.

want to be exposed.

Why majority of the popu-

to following reasons:

examination

isolated.



formation about affected area of this district from a family who came to our camp in district Kushtia for examination. In this district we found arsenic affected families even at the heart of the city (P.T.I Road) but the health centre which is only half a kilometer away from the site was not aware of that. Here the rich families are also affected but the poor people are suffering more. We came in contact with a family where all members including two small children have arsenical skin manifestations. Getting information that in Shyamnagar village of thana Mohammadpur people were also suffering, we went there and found mainly in a family about 12 members affected. They reported that after installing their new tubewell, they started drinking that water and within six weeks all of them started getting black in complexion with many neurological problem. Many told that they had become black like charcoal, but after discontinuing that tubewell water they recovered to some extent. With our West Bengal experience we have seen people becoming black (diffuse melanosis) but not so quickly as we heard from villagers of Shyamnagar. We also encountered similar incident in Bheramara, Kushtia.

District Meherpur: In this district we also surveyed the municipal area of the city and found presence of arsenic. Here from arsenicosis. Only one old lady in his family is not affected and the reason is she does not like the taste of tubewell water and so she drinks pond water after boiling.

District Laxmipur: We had the information with us of 3 thanas and 8 villages but we could survey only 3 villages in Thana Ramgonj only. In Sripur village we met a 22-year-old young lady (Photograph - 12) who was divorced due to her severe skin lesions. In the next village we met a college student who told that he had read about arsenic problem in newspaper but only after we met him he came to know that not only he but his whole family was also suffering from arsenical skin lesions. He further told us that his family spent all their resources for their treatment. In this village of Chandipur we met a young couple and both of them were seriously affected. The husband told that to get her wife cured he had already sold most of his land. Now he is going to sell his last piece of land and will take her to Dhaka for treatment.

District Noakhali: In this district we have covered 2 villages, Bhimpur and Lamchar in one Thana (Chatkhil). In village Lamchar almost all were affected and we left the village without total survey. Young girls of this village suffering from skin lesions have the common question: will they get better or they will be burden of

Photograph-14: Mrs. Sabitri Rani Vill: Palpara PS: Sonargaon Dist: Narayanganj was admitted in SSKM hospital of Calcutta with skin lessions and ascitis.

palm and sole. senic affected area of Khulna. Here we have surveyed only one village in Rupsa thana. One pa-

Photograph-12: Mrs Nurjahan, Vill: Srirampur

PS: Ramganj, Dist: Noakhali has keratosis on

skin lesions and she was complaining that in the village no one comes to her house and even if she goes to tubewell to collect drinking water, villagers clean the tubewell after she has taken water. They feel she is suffering from leprosy. Many died in this village.

District Jessore: In this district we practically surveyed only one village (Samta) in Sarsa thana. This is one of the worst affected villages we have encountered during our last 10 years field study in arsenic affected villages. Villagers said that in each family one or two had died. Since we reached this village almost in the evening and the villagers were rather hostile we could survey only a few families. Villagers are very angry as for last one year many organisations came to see them but none could provide safe water. We came back as we had realised their feelings. Photograph-7 shows one patient whose palm was amputated due to skin cancer. Ranu is the lone survivor of 5-member family. She told us that her parents, brother, sister all died within last few years and all had severe skin lesions. In Jessore out of 12 children examined 3 have arsenical skin

District Magura: We got in-

also villagers were very hostile their parents? Many people as they complained that no safe water so far was arranged for and informed us that there are the village people. Moreover they complained that doctors came and took their live skin for testing and they suffered from that injury for a long

District Chuadanga: In this district we could survey two villages Banagari and Takpara in Alamdanga thana. Benagari village is also worst affected. Most of the families have lost one or two relatives. Almost all adult male and female members are affected. As the villagers have no alternative tubewell, they are drinking the same high arsenic rich water. They met government officials for safe water but all in vain. Photograph - 10 shows young women

having severe skin lesions. District Chandpur: Arsenic affected Chandpur, Lakshmipur and Noakhali districts are in the eastern end of Bangladesh. We had the information of 3 thanas and six villages in Chandpur district but we could cover only one village, North Chandpur. In this village 3 families lost their nearest ones. Old man told us that till death doctors could not identify the disease of his wife even though she had severe skin lesions. The old man told that for last one year they are aware that these skin lesions are due to arsenic toxicity and all members of his

family are at present suffering

came from adjacent villages also similar patients in their villages and requested us for examination and treatment.

District Narayanganj: This was the last district in our survev schedule and we stayed there for only a few hours. District Naravangani is about 20 km away from Dhaka city centre. After meeting the doctors of the district hospitals we came to know that very recently they have got the expertise to identify arsenic patients and already they have found arsenic patients in Faridpur, Shadipur, Patalpur, Tajpur, Doelarbag, Hatkopa and Paulpara villages. During our short visit we could survey only Hatkopa village. This is a village where well-todo families live and some of them are also seriously affected. It appears that high arsenic concentration is responsible for their illness as nutrition status of the victims is good. Photograph -14 shows a woman from Paulpara. She has severe skin lesions and fluid in abdomen (aseitis).

Groundwater use for irrigation and domestic purpose in Bangladesh through deep and shallow tubewells.

In Bangladesh irrigation using groundwater, first started with deep tubewells (around 300 ft deep) during middle of 60 's for high yield varieties of paddy. Green revolution started

during the regime of Ayub Khan (1967). More and more big diameter (6" - 8") deep tubewells were sunk and controlled by government sector. Installation of deep tubewells continued till middle of 80's. Due to mismanagement, deep tubewells were dominated by rich farmers so the poor farmers started using shallow tubewells from 70's and later on it flourished as government procured shallow tubewell materials from abroad and sold those to farmers on credit or cash. Like in West Bengal there is no groundwater withdrawal regulation in

How to Combat the Situation

Bangladesh.

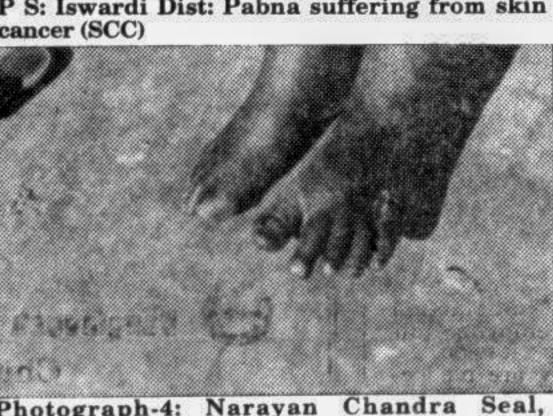
In Bangladesh irrigation with deep tubewells started in later part of 1960. Although Bangladesh has huge wet land, flooded river basins, Ox-bow lakes, high rainfall, still groundwater is considered the major water resume in many districts and its use is increasing day by day. Photograph -17 shows that in district Jhenidah when the 'Chotopatra Beel' has enough water, the nearby villagers are withdrawing groundwater for irrigation. To combat the arsenic situation what we badly need is water shed management and awareness campaign at village level. In Ronpiboon, Thailand, rain water is used by the villagers not only during rainy season but also couple of months after, using huge storage tank. Other than the prime objectives of proper watershed management from the last 10 years' experience in West Bengal's arsenic affected areas we may suggest some measures to combat the situation. These are:

- 1. First, let us aware the villagers the danger related to arsenic contaminated water for drinking and cooking and inform them that this is not 'wrath of God' or 'curse of God'. Let us also inform that this is not a contagious disease and with arsenic patient one can sleep and eat.
- Let the villagers know that if safe water is used for drinking and cooking they will be out of danger. Normally, in arsenic affected villages there are at least some tubewells which are safe for drinking water. The government, village level authority, NGO should identify those and mark with colour after analysis and inform the villagers to use their water for drinking and cooking. However, the safe tubewells should be checked after every three months. In Bangladesh most of the tubewells we have analysed so far for arsenic are found to be safe and so the authority should think how they can manage to have deep tubewells for the public, keeping in mind this may be temporary solution.
- From West Bengal experience we have seen that many of those having diffuse melanosis or earlier pigmentation, have returned to normal life using safe water with some nutritious food and daily exercise. During our field survey in Bangladesh we have also heard from villagers that many of them regained their skin colour after using only safe water.

Over exploitation of underground water for agriculture is becoming very common in developing countries e.g. India, Bangladesh and China. Millions are exposed to arsenic and fluoride alone in India and China and consequently huge populations are suffering from arsenicosis and fluorosis drinking contaminated groundwater. The calamity of Bangladesh can be brought under control if only withdrawal of groundwater is re-If this is not stricted. done. Bangladesh has to face a serious consequence of its arsenic problem.

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Photograph-1: Md Musleuddin, Vill: Charrupur, P S: Iswardi Dist: Pabna suffering from skin cancer (SCC)



Photograph-4: Narayan Chandra Seal, Tapakhola, Faridpur Sadar suffering from skin cancer (SCC)

arsenic affected villages of due to shortage of time we had Bangladesh.

Further, out of 50 deep-tube- of the village unexamined. well water samples (above 700) of 28 districts we have analysed so far, none contained arsenic above 0.05 mg/1, but 3 contained arsenic between 0.01-0.049. It appears at present that deep tubewells are safe. However, from our experience in West Bengal we have doubt as to how long even these deep-tubewells will remain safe.

Out of 64 districts in Bangladesh we expect 30 districts where groundwater should not be arsenic contaminated. These are the districts above the boundary line (in Map-1) and hilly areas. Out of these 30 districts so far we have analysed 321 water samples

skin lesions, we have collected 934, 166 and 222 samples of hair, nail, urine and skinscales from both affected and non-affected people. Our analytical results show that in average about 91% of the analysed samples have arsenic higher

from 9 districts (Map-2) and all are safe to drink with respect to Analysis of Biological Samples From 45 villages of 18 districts where we have identified people suffering from arsenical

than permissible limit for human body. Some people who have no arsenical skin lesions



and at that time young were in field for work. We were friendly informed by the villagers

were in the field.

to weakness.

Normally

village

District

Districts During the 3-week-long field visit by DCH and SOES survey team in 14 districts where we have found people suffering from arsenicosis, we had encountered different village problem in each district. problems are narrated here for better understanding of the arsenic situation.

Condition of the Affected

district has 9 thanas and we have made spot survey covering 3 thanas and 5 villages. In Pabna district, Charruppur village of Ishurdi thana is seriously affected. In one family five died out of eight and all died had severe arsenical skin lesions. Those alive are also suffering seriously. Photograph-1 is one of them and suffering from skin cancer. In this village 24 contaminated tubewells ware sealed for high arsenic by governmental officials without boring a new one. At the end villagers re-installed their tubewells and drinking contaminated water. In Santhia thana the villagers told that in their union there are about 200 big-dia (8") deep tubewells for agricultural use and when these tubewells are in operation (sometimes they run for 18 hours in a day), in shallow hand tubewells they do not get water. This clearly indicates the fall of water tables due to heavy water withdrawal

amputated due to cancer (SCC) District Kushtia: In Kushtia, there are 6 thanas and of those we have surveyed sporadically 3 thanas and 5 villages. In Ramkrishnapur village of Bheramara thana, children are also seriously affected. In Kushtia town, the Courtpara area at the heart of the city is also affected and some well-to do families have lesions. In arsenical skin Khordasadua village of Khoksha thana, a university student complained that he had spent more than Tk. 40,000 for treatment of his skin lesions and bronchial problem over the last 5 years and very recently he came to know that he was suffering from arseni-

cosis. In this village even

Photograph-7: Md Abdus Satter, Vill: Samta PS:

Sarsa, Dist: Jessore his fingers of left hand

small children are affected District Rajbari: For this district we got the information from a health centre doctor that one tubewell was sealed by a village doctor in Padamdi village under Baliakandi thana. The village doctor and his family are suffering from some skin disease and so he suspected it may be due to arsenic. We went to that area and could survey only 2 villages in Baliakandi Thana. It was a remote area and one has to walk kilometers to reach the village. We examined only two families and all the members of these two families are affected. It appears that if we survey more, more area with many affected families will be found out. Photograph -3 shows the arsenic affected family of a village doctor.

District Faridpur: This district has 8 thanas. In this district we could survey only Faridpur town and we had covered two areas. One of these two areas, Tepakhola, is highly affected and almost in all affected families, at least someone had died and many have severe arsenical skin lesions. One of the patients (Photograph-4) has almost all arsenical dermatological symptoms. He is also suffering from skin cancer. In this family, there are 7 members and except one everybody has several arsenical skin le-

died in this district.

previous information about ar-

Tuesday 29th April (All programmes are in local time. There may be changes in the programmes.) BTV 3:00 Opening announce ment Al Quran Programme summary 3:10 Recitation from

District Bagerhat: This district has 9 thanas and out of those we could survey only 5 villages of one thana, Fakirhat. This is the only thana where some deep tubewells have been installed for public and all these deep tubewells are safe to drink from. But the strange fact is when in many affected villages there is not a single deep tubewell, here within half kilometer, there are three deep tubewells. This thana is highly affected. Due to shortage of time we could not cover the affected villages when plenty of people wanted to be examined having arsenical skin lesions. We feel thousands are affected in Fakirhat thana alone. Many

District Khulna: We had no

News 2:30 Time Out : Jeremy Clarkson's Motorworld UK 3:00 BBC World News 3:30 Hard Talk 4:00 BBC World News 4:30 Time Out : Tomorrow's World 5:00 BBC Newsdesk 6:00pm BBC Newsdesk 6:30 World Focus: Window On Europe 7:00 BBC World News 7:15 World Business Report 7:30 BBC Newshour Asia & Pacific 8:30 Time Out: Holiday 9:00 BBC World News 9:30 Hark Talk 10:00 BBC World News 10:30 Time Out: Film '97 11:00 The World Today 12:00mn The World

the Geeta 3:15 Film: Dynasty 4:00 News in Bangla 4:05 Hijal Tamal 4:50 Education for All 5:20 Sangeeta: Programme of Modern songs 6:00 TV Debate 7:00 The News 7:05 Open University 7:25 Programme up-Today 12:30 Hard Talk 1:00 holding the spirit of freedom BBC World News 1:30 World Fofighting 8:00 News in Bangla cus : Britain In View 2:00 BBC 8:40 Drama serial: Satpaura World News 2:30 Time Out : The Kabya 10:00 News at Ten Clothes Show 3:00 BBC News-10:30 Swastya Tathya 10:35 desk inc World Business Report Geetishatadal 11:30 News in & 24 ars 4:00 BBC Newsdesk Bangla 11:35 Wednesday's inc Asia Today & World Busiprogramme summary 11:45 ness Report 5:00 BBC World Close down New: 5:10 Newsnight

STAR PLUS

6:00am BBC World News 6:30 Time Out: Tomorrow's World 6:30 Ninaad 7:30 Good Morning 7:00 BBC Worldnews inc. World India 9:30 Aerobics Oz Style Business Report/Asia To-10:00 Yan Can Cook 10:30 E! day/24 Hours 10:00 BBC World TV For Your Entertainment News 10:30 World Focus: Window 11:00 Charles In Charge 11:30 On Europe 11:00 BBC Newsdesk The Oprah Winfrey Show 12:30 12:00 BBC Newsdesk 12:30 Hard Talk 1:00 BBC World The X Files 1:30 Santa Barbara News 1:30 World Focus: Window 2:30 The Bold & The Beautiful On Europe 2:00 BBC World 3:00 Hindi Serial: Imtehan 3:30

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Hindi Serial: Sangharsh 4:00 Hindi Serial: Tu Tu Main Main 4:30 Lost in Space 5:30 Black Beauty 6:00pm Charles In Charge 6:30 Yan Can Cook 7:00 Hindi Serial: Janata Ki Adala 7:30 Star News (Hindi) 8:00 Small Wonder 8:30 Hindi Serial Kya Baat Hail 9:00 Meri Awaz Suno 9:30 Star News (English) 10:00 Hindi Serial: Ek Din Ek Jeevan 10:30 Space: Above and Beyond 11:30 The Bold & The Beautiful 12:00 Santa Barbara 1:00 Star News 1:30 Baywatch 2:30 Dynasty 3:30 Fantasy Island 4:00 The Oprah Winfrey Show 5:00 Barnaby Jones

ZEE TV

6:00 Jagran 6:30 ZED 7:00 ZED 7:30 Index 8:30 Adamiya Pradhan Mantri 9:00 Disney Hour 10:00 Gaane Anjaane 10:30 Lakme Khoobsurat 11:00 Chutki Baja Ke 11:30 Close Up Antakshri 12:00 Chanakya 12:30 Chanakya 1:00 Mere Ghar Ana Zindagi 1:30 Silsila 2:00 Hum Paanch 2:30 Tara 3:00 Raahat 3:30 Dhara Zaike Ka Safar 4:00 Haathi Cement Aashiana 4:30 Jhatpat Khana 5:00 Celeste 5:30 Casper Kya Scene Hai 6:00 Aur Ek Minute 6:30 Disney Hour 7:30 Raahat 8:00 Gaane Anjaane

The Daily Star Entertainment Guide 8:30 Nirma Hum Paanch 9:00 Sailaab 9:30 Sapath 10:00 Hasratein 10:30 News 11:00 Tara 11:30 Dastaan 12:00 TVS Saregama 12:30 Andaz 1:00 Chahat Aur Nafrat 1:30 Raahat 2:00 Shotgun Show 2:30 TMM 4:00 Suhana Safar 4:30 Bournvita Quiz Contest 5:00 Surtaal 5:30 Suno Bhai Sadho

DD 7

10:30 Janmadin 10:35 Classical Music 11:00 Ghare Baire 11:30 Parliament Hour 12:30 Nabaianma (Serial) 1:00 Janmabhumi (Serial) 1:30 Trishna 2:00 Gaan 2:30 Bakul Katha (Serial) 3:00 Aaleya (Serial) 3:30 Basanta Bihar (Serial) 5:05 Science Prog-Bignan Prasange 5:20 News 5:30 Employment News/Lalitkala 6:00 Palli Katha 6:30 Gaan Niye 7:00 Serial 7:30 Bangia Sambad 7:55 Dinindan 8:00 Bakul Katha 8:30 Aaleya (Serial) 9:00 Janmabhumi (Serial) 9:30 Parichay (Serial) 10:00 Bengali Movie Club Film Show : Parbesh 1:00 Closed

SONY ET

8:30am Khoya Khoya Chaand 9:00 The Three Stooges 9:30

Dream Of Jeannie 10:30 Bewitched 11:00 Taak Jhank 11:30 Gaane Jaane Maane 12:00 Ghaav 12:30 Premier 1:00 Jane Kahan Mera Jigar Gayji 1:30 The Young And The Restless

Dennis The Menace 10:00

2:30 Cine Matinee-Hindi Feature Film 5:30 The Three Stooges 6:00 Dennis The Menace 6:30 Khoya Khoya Chand 7:00 Dream of Jeannie 7:30 Bewitched 8:00 Surf-Wheel Of For tune 8:30 Cine Prime Hindi Film 11:00 The Young and Restless 12:00 Taj Mahal Takita Dhin 1:00 Mahayagaa 1:30 Surf-Wheel Of Fourtune 2:00 Premier 2:30 Closed

EL TV

12:30 Hindi Feature Film 2:00

Gulmohar West 2:30 Lumsa Tea Chalo Cinema 3:00 Ru-Ba-Ru 3:30 Hey Ha Ho 4:00 HFF (B/W) 7:00 Music Capsules 7:30 Stand By 7:40 Music Capsules 8:30 Haseen Pal 8:40 Teen Do Paanch 9:00 Chehre 9:30 V3+ 10:30 Hindi Feature Film 1:00 Jaguar It's My Choice 1:30 S Kamal Kombination 2:00 Gujarati Band 3:00 Rajani 3:30 Anurag 4:00 Dard 4:30 ZED 5:00 HFF 7:50 Haseen Pal 8:00 HFF 8:45 Stand By 9:00 HFF.