



# BRAINY IAS

## Contributions And Achievements Of Stephen Hawking

### Relevancy:

- ✓ GS Prelims, GS Mains paper III
- ✓ Sci-tech, contributions of Stephen Hawking, Black holes, theory of relativity, quantum physics, AML disease.

### Recently:

- ❖ Renowned Physicist Stephen Hawking died.

### Key Achievements of Stephen Hawking:

- Hawking was known for bringing about a limited union between two very different fields: Albert Einstein's general theory of relativity and quantum theory.
- On Black holes: At one time it was thought that absolutely nothing could escape from a black hole. Hawking's equations produced an amazing result – that over time black holes can lose energy – now known as Hawking radiation – hence they can shrink and 'evaporate,' disappearing from the universe.
- On Big Bang: In 1970, working with Roger Penrose, Hawking showed that if a Big Bang had happened and general relativity were true, then the universe must have grown from a point whose volume was zero, but which contained the entire mass of the universe. Such a point of infinite density is known as a singularity.
- Interestingly, at the heart of every black hole lurks a singularity, where gravity has crushed the entire mass of the black hole into a point whose volume is zero.

### AML- The disease that made Hawking paralysed:

- Amyotrophic lateral sclerosis, more commonly known as ALS, is a progressive, neurodegenerative disease.
- It affects the nerve cells in the brain and spinal cord that make the muscles of both the upper and lower body work.
- Those nerve cells lose their ability to initiate and control muscle movement, which leads to paralysis and death.
- People with the condition lose control of muscle movement, eventually losing their ability to eat, speak, walk and, ultimately, breathe.
- A highly successful lecturer and author, from 1986 Hawking made use of an adaptive communication system including a speech synthesizer known as the Equalizer to combat ALS.
- Using the Equalizer, he authored books, scientific papers, and lectures, and was capable of communicating at the modest rate of about 15 words per minute.



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## KUSUM Scheme- Harnessing Solar Power For Rural India

### Recently:

- ✓ GS Prelims, GS Mains paper II, III
- ✓ Schemes of government, Solar power, KUSUM scheme

### Relevancy:

- ❖ The Government of India is in the process of formulating a Scheme 'Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM)'.

### The scheme will provide for:

- Installation of grid-connected solar power plants each of capacity up to 2 MW in the rural areas;
- Installation of standalone off-grid solar water pumps to fulfill irrigation needs of farmers not connected to grid;
- Solarization of existing grid-connected agriculture pumps to make farmers independent of grid supply and also enable them to sell surplus solar power generated to DISCOM and get extra income; and
- Solarization of tube-wells and lift irrigation projects of Government sector.

### Benefits:

- This would provide an opportunity to the farmers to sell the additional power generated through the solar plants installed on their barren lands to the grid.
- Transmission losses of DISCOMS can be checked.
- It shall facilitate decentralising solar power production.
- Subsidy burden on DISCOMS in the agricultural sector will be reduced significantly.
- Water conservation, water security and energy efficiency are the other benefits to the farmers from the implementation of this programme.
- This scheme will help in de-dieseling (replacing the diesel pumps) the agricultural sector in the country.
- It will provide a fillip to the emerging green economy in India.



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## NFHS-4 Finding On Marital Rape

### Relevancy:

- ✓ GS Prelims, GS Mains paper II
- ✓ Governance, gener issues, marital rape, National Family Health Survey-4 findings

### Recently:

- ❖ National Family Health Survey (NFHS-4) reveals some disturbing statistics about marital violence against women.

### Findings of the survey:

- 31 per cent of ever-married women have experienced physical, sexual or emotional violence at the hands of their spouse, with physical abuse being the most common.
- Injuries, ranging from sprains to broken bones and burns, have been sustained by nearly 25 per cent of women who have ever suffered from spousal violence.
- The most common form of reported sexual violence was the use of physical force by the husband for sexual intercourse against the will of his wife.
- According to the NFHS-4, 59 per cent of women between 15-49 years are still not “allowed” to go to a market or health facility by themselves.
- Further, 52 per cent of women and 42 per cent men are of the view that violence by the husband is justifiable in a variety of situations, including if the wife refuses to have sex with him.
- These attitudes have not improved significantly since NFHS-3.
- This data calls for a legislation for criminalizing Marital rape in India.

### THE ‘EXCEPTION CLAUSE OF SECTION 375 OF IPC:

- Currently, Section 375 of the Indian Penal Code (IPC) that pertains to rape, has an “exception provision” because of which it is not applicable to sexual intercourse or sexual acts by a husband with his wife provided she is not under 18 years of age.
- Till very recently, this exemption also applied to a married minor girl above 15 years, however, it was modified to align it with the Protection of Children from Sexual Offences Act, 2012 as well as other pro-child legislations.
- Following the horrific Delhi gang rape of December 2012, the Justice J S Verma Committee had recommended doing away with the marital rape exemption from law.

### What if the potential law is misused by women?

- All laws have the potential to be misused. Why then does this get raised vociferously only in the context of an enabling legislation for women.
- It seems grossly unfair to assume that women would want to destabilise their own marriages by slapping false cases against their husbands.
- Walking out of a marriage by filing for divorce is perhaps easier than attempting to manipulate the law.
- If we see the figures, as per NFHS-4, only 14 per cent women who experienced violence attempted to seek help, down from 24 per cent in NFHS-3.
- Consider the dowry cases under Section 498A of the IPC: While some cases of potential misuse of the anti-dowry provisions have come to the fore, it has also provided tremendous respite for a large number of women who were experiencing physical or mental torture in their matrimonial homes and did not have any other recourse.

### THE CHALLENGE OF PROVING CHARGES OF MARITAL RAPE:

- Circumstantial evidence would play an important role in building the case, similar to any other instance of alleged rape.
- A history of physical violence or sexual abuse, which can be established by forensic evidence can unfold the story.
- Further, witness testimonies could be taken into account. It is, of course, important to note that just because a crime is difficult to prove does not mean that it can be ignored altogether.

### CONCLUSION:



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- While all possible safeguards should be in place for ensuring that no innocent man is wronged, every effort also needs to be made to ensure that a woman's freedom and right to life is not compromised.
- Marriage is undoubtedly an important institution but violence of any kind should not be condoned by a civilised society.
- After all, rape is rape, regardless of whether the perpetrator is a stranger or a spouse



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