

The Empowerment of Women in Promoting Happiness in her Own Environment using Fuzzy Cognitive Maps

A. Victor Devadoss¹, K. Sudha²

PG and Research Department of Mathematics, Loyola College, Chennai, India
Email: hanivictor@ymail.com, ashu.8788@gmail.com

Abstract -Empowerment is now increasingly seen as a process by which the one's without power gain greater control over their lives. This means control over material assets, intellectual resources and ideology. It involves power to, with and power within. Some define empowerment as a process of awareness and conscientization, of capacity building leading to greater participation, effective decision-making power and control leading to transformative action. In this paper we use Fuzzy Cognitive Maps to analyze the standard of living to empower women with decision making power over their work and income which in turn promotes happiness.

Keywords- Empowerment of women, Standard of living, Happiness, Fuzzy Cognitive Maps.

I. INTRODUCTION

Empowerment is now increasingly seen as a process by which the one's without power gain greater control over their lives. This means control over material assets, intellectual resources and ideology. It involves power to, power with and power within. Some define empowerment as a process of awareness and conscientization, of capacity building leading to greater participation, effective decision-making power and control leading to transformative action. This involves ability to get what one wants and to influence others on our concerns. With reference to women the power relation that has to be involved includes their lives at multiple levels, family, community, market and the state. Importantly it involves at the psychological level women's ability to assert themselves and this is constructed by the 'gender roles' assigned to her specially in a cultural which resists change like India.

In an effort to develop strategies for empowering women, some programmes are sensitive to recognizing women's contribution and their knowledge as the first step. They appreciate that women require principally social support to fight their sense of inadequacy and fears to enhance their self-respect and dignity. Empowering women means control over their bodies and becoming economically independent, controlling resources like land and property and reduction of burden of work. A society or programme which aims at women's empowerment needs to create and strengthen sisterhood and to promote overall nurturing, caring and gentleness. Researchers often emphasise on women Self-Help groups (SHG's) as a collective one such effort. Women are capable of these functions given sufficient, nutrition, education and other support. Women are most often not treated as subjects.

II. CONCEPT OF EMPOWERMENT OF WOMEN

Women's empowerment is a process in which women gain greater share of control over resources - material, human and intellectual like knowledge, information, ideas and financial resources like money - and access to money and control over decision-making in the home, community, society and nation, and to gain 'power'. According to the Country Report of Government of India, "Empowerment means moving from a position of enforced powerlessness to one of power". There are various fields of empowerment related to women. In particular here we analyze the problem of social empowerment of women like education, health, nutrition, drinking water and sanitation, environment, science and technology, women in difficult circumstances, violence against women, rights of the girl child and mass media. To develop this will lead to equality, sustainability, empowerment and happiness of women in their environment.

III. HUMAN CAPABILITIES

According to Martha Nussbaum (2003) first, that there are certain functions that are particularly central to human life. Second, that there is something do these in a truly human way, not a mere animal way. The list of capabilities that she draws is cross-cultural as necessary element of truly human functioning. They include:

1. Life-being able to live to the end of human life of normal length: not dying prematurely, or before one's life is so reduced as to be not worth living.
2. Bodily health – being able to have good health including reproductive health, to be adequately nourished, to have adequate shelter.
3. Bodily integrity – Being able to move freely from place to place, to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sex satisfaction and for choice in matters of reproduction.
4. Senses, imagination and thought – Being able to use the sense, to imagine, think and reason in a truly human way including but not limited to literacy. Being able to use one's mind and imagination protected by freedom of expression.
5. Emotions – being able to have attachments, to love, to grieve to experience longing, gratitude and justified anger. Not having one's emotional development blighted by fear and anxiety.
6. Practical Reason – Being able to form a conception of the good and to engage in critical reflection about planning of one's life's protected by liberty of conscience.
7. Affiliation – Being able to live with and toward others to have social interactions, to have the capability of both justice

and friendship. This would entail freedom of assembly and free speech. Having social bases for self-respect and non-humiliation, being protected against discrimination on the basis of race, sex, sexual orientation, religion, caste or region.

- 8. Other species – Being able to concern with nature.
- 9. Play – being able to laugh, play and enjoy.
- 10. Control over one's environment.

a) Political. Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.

b) Material. Being able to hold property to seek employment on equal bases and having freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with the workers.

These capabilities cover the so called "first generation rights" (political & civil liberties) as well as the "second generation rights" (economic and social rights). It has been emphasized that women all over the world have been short shifted and have not found support for their central human functions. Women are as capable as men of exercising will, controlling desires and taking decisions but males enjoy support of social institutions and women are excluded as the 'other'. Women are often not treated as "ends in themselves" persons with dignity who deserve respect from laws and institutions instead they are treated instrumentally as reproducers, caregivers, sexual receivers, agents of family's general prosperity.

IV. FUZZY COGNITIVE MAPS (FCM)

The notion of Fuzzy Cognitive Maps (FCMs), which was introduced by Bart Kosko in the year 1986. FCMs have a major role to play mainly when the data concerned is an unsupervised one. The FCMs work on the opinion of experts. It can give the hidden pattern of the problem under analysis. Further this method is most simple and effective one as it can analyze the data by directed graphs and connection matrices.

A. Basic notion for FCM

An FCM is a directed graph with concepts like policies, events etc. as nodes and causalities as edges. It represents causal relationship between concepts. When the nodes of the FCM are fuzzy sets then they are called as fuzzy nodes.

FCMs with edge weights or causalities from the set $\{-1, 0, 1\}$ are called simple FCMs. Consider the nodes / concepts C_1, \dots, C_n of the FCM. Suppose the directed graph is drawn using Edge weight $e_{ij} \in \{0, 1, -1\}$. The matrix E be defined by $E = (e_{ij})$ where e_{ij} is the weight of the directed edge $C_i C_j$. E is called the adjacency matrix of the FCM also known as the connection matrix of the FCM. Let C_1, C_2, \dots, C_n be the nodes of an FCM.

$A = (a_1, a_2, \dots, a_n)$ where $a_i \in \{0, 1\}$. A is called the instantaneous state vector and it denotes the on-off position of the node at an instant.

$$a_i = 0 \text{ if } a_i \text{ is off and}$$

$$a_i = 1 \text{ if } a_i \text{ is on for}$$

$$i = 1, 2, \dots, n.$$

Let C_1, C_2, \dots, C_n be the nodes of an FCM. Let $C_1 C_2, C_2 C_3, C_3 C_4, \dots, C_i C_j$ be the edges of the FCM ($i \neq j$). Then the edges form a directed cycle. An FCM is said to be cyclic if it possesses a directed cycle. An FCM is said to be acyclic if it does not possess any directed cycle. An FCM with cycles is said to have a feedback. When there is a feedback in an FCM, i.e., when the causal relations flow through a cycle in a revolutionary way, the FCM is called a dynamical system.

Let $C_1 C_2, C_2 C_3, \dots, C_{n-1} C_n$ be a cycle. When C_i is switched on and if the causality flows through the edges of a cycle and if it again causes C_i , we say that the dynamical system goes round and round. This is true for any node C_i , for $i = 1, 2, \dots, n$. The equilibrium state for this dynamical system is called the hidden pattern. If the equilibrium state of a dynamical system is a unique state vector, then it is called a fixed point. If the FCM settles down with a state vector repeating in the form $A_1 \rightarrow A_2 \rightarrow \dots \rightarrow A_i \rightarrow A_1$ then this equilibrium is called a limit cycle.

V. ADAPTATION OF FCM TO THE PROBLEM

We use the following seven nodes of FCM which are labeled as follows

C_1 – Education

Equal access to education for women and girls needs to be ensured. Special measures should be taken to eliminate discrimination, universalize education, eradicate illiteracy, create a gender-sensitive educational system, increase enrolment and retention rates of girls and improve the quality of education.

C_2 – Health

A holistic approach to women's health which includes both nutrition and health services should be adopted and special attention should be given to the needs of women and the girl at all stages of the life cycle. The reduction of infant mortality and maternal mortality, which are sensitive indicators of human development, is a priority concern. Women's traditional knowledge about health care and nutrition needs to be recognized through proper documentation and its use shall be encouraged.

C_3 – Nutrition

In view of the high risk of malnutrition and disease that women face at all the three critical stages viz., infancy and childhood, adolescent and reproductive phase, focused attention should be paid to meeting the nutritional needs of women at all stages of the life cycle.

C_4 – Environment

The vast majority of rural women still depends on the locally available non-commercial sources of energy such as animal dung, crop waste and fuel wood. In order to ensure the efficient use of these energy resources in an environmental friendly manner, we should aim at promoting the programmes of non-conventional energy resources. Women will be involved in spreading the use of solar energy, biogas, smokeless chulahs and other rural application so as to have a

visible impact of these measures in influencing eco system and in changing the life styles of rural women.

C_5 – The role of mass media

The media should be encouraged to develop codes of conduct, professional guidelines and other self regulatory mechanisms to remove gender stereotypes and promote balanced portrayals of women and men.

C_6 – Violence against women

All forms of violence against women, physical and mental, whether at domestic or societal levels, including those arising from customs, traditions or accepted practices shall be dealt with effectively with a view to eliminate its incidence. Institutions and mechanisms/schemes for assistance should be created and strengthened for prevention of such violence, including sexual harassment at work place and customs like dowry; for the rehabilitation of the victims of violence and for taking effective action against the perpetrators of such violence. A special emphasis should also be laid on programmes and measures to deal with trafficking in women and girls.

C_7 – Rights of the girl child

All forms of discrimination against the girl child and violation of her rights shall be eliminated by undertaking strong measures both preventive and punitive within and outside the family. These should relate specifically to strict enforcement of laws against prenatal sex selection and the practices of female foeticide, female infanticide, child marriage, child abuse and child prostitution etc. Removal of discrimination in the treatment of the girl child within the family and outside and projection of a positive image of the girl child should be actively fostered. In implementing programmes for eliminating child labor, there will be a special focus on girl children. The expert’s opinion is given as directed graph and the related fuzzy relational matrix is given below:

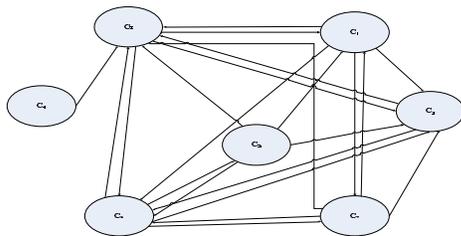


Figure-1

$$E = \begin{bmatrix} 0 & 1 & 1 & 0 & 0 & -1 & 1 \\ 1 & 0 & 1 & 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 & 0 & -1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 & -1 & 0 \\ 0 & -1 & -1 & 0 & -1 & 0 & -1 \\ 1 & 1 & 1 & 0 & 0 & -1 & 0 \end{bmatrix}$$

Let E denotes the connection matrix of the directed graph. Now to find the stability of the dynamical system or to be more precise the hidden pattern of the system which may be a fixed

point or a limit cycle. We consider the state vector $C_1 = (1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0)$.

That is, Education to be in the ON state and all other nodes are in the OFF state, passing C_1 in to the connection matrix E We get

$$C_1 E = (1 \ 1 \ 1 \ 0 \ 0 \ -1 \ 1)$$

After thresholding we get

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_2$$

Now passing C_2 in to the connection matrix E we get

$$C_2 E = (2 \ 3 \ 3 \ 0 \ 0 \ -4 \ 1)$$

After thresholding we get

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_2$$

Thus we conclude that hidden pattern is a fixed point which shows education, health and nutrition leads to increase rights of the girl child. This will create happiness in women’s life.

Let us consider the state vector

$$C_1 = (0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0)$$

That is nutrition to be in the ON state all other nodes are in the OFF state, passing C_1 in to the connection matrix E We get

$$C_1 E = (0 \ 1 \ 1 \ 0 \ 0 \ -1 \ 0)$$

After thresholding we get

$$\hookrightarrow (0 \ 1 \ 1 \ 0 \ 0 \ 0 \ 0) = C_2$$

Now passing C_2 in to the connection matrix E We get

$$C_2 E = (1 \ 1 \ 2 \ 0 \ 0 \ -2 \ 0)$$

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 0) = C_3$$

Again passing C_3 in to the connection matrix E We get

$$C_3 E = (1 \ 2 \ 3 \ 0 \ 0 \ -3 \ 1)$$

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_4$$

Similarly,

$$C_4 E = (2 \ 3 \ 4 \ 0 \ 0 \ -4 \ 1)$$

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_4$$

Thus hidden pattern is a fixed point.

Let us consider the state vector

$$C_1 = (1 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0)$$

That is education and health to be in the ON state and all other nodes are in the OFF state, passing C_1 in to the connection matrix E We get,

$$C_1 E = (2 \ 2 \ 2 \ 0 \ 0 \ -2 \ 2)$$

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_2$$

Now passing C_2 in to the connection matrix E We get,

$$C_2 E = (3 \ 3 \ 3 \ 0 \ 0 \ -4 \ 2)$$

$$\hookrightarrow (1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1) = C_2$$

Thus we conclude that hidden pattern is a fixed point. This also shows education, health and nutrition leads to increase rights of the girl child.

VI. CONCLUSION

From this we conclude that the empowerment of women depends more on giving priority to education, health, nutrition and the rights of the girl child. The needs of the girl child and earmarking of substantial investments in the areas relating to food and nutrition, health and education, and in vocational education will improve happiness in woman's life. By educating its women, a country can reduce poverty, improve productivity, ease population pressure and offer its children a better future. Rights of the girl child will leads to equality, sustainability, empowerment and happiness of women in their environment.

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