Public Private Partnership based Distributed Computing for Societal Development: A Case Study of Drought Affected Rural Tahsil in Satara District (India)

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ABSTRACT
Availability of information has a key importance. Due to lack of in time information, the societal problems arises like disaster i.e. drought. Authors found that redressing of drought becomes more complex and rigorous. Survey shows that present computations does not support for public based sharing of the information to support and assist the community in the drought affected selected area viz. Tashil Khatav in Satara district. The public based systems are in place but their support is inadequate and it is found that there is big delay for providing the redressing information to the affected area and the community users. Authors felt a need to apply the Public Private Based Computing for the information sharing and availability to support the society in varied ways as a part of redressing strategy of drought affected community in the Satara district. Paper also suggests how does this computer based societal serving mode plays the vital role in the development of the user in the community which may help both the information providers and suppliers too with optimum usage of human resources and the components of Information Technology

KEYWORDS
Public Private Partnership Computing Model, Delay, Availability, Information System, Redressing Mechanism, Self Help Groups.

1. INTRODCUTION
Drought is a one of the natural climate variability. It may be observed in all climates. It is usually characterized due to lower average of water availability for the population. There are three types of droughts [8, 9]. They are: Meteorological Drought, Hydrological Drought and Agricultural Drought. Paper aims at the study of drought affected community in Satara district as a case study and the study of proposed redressing mechanism. Here authors proposed to make use of Public Private Partnership (PPP) based computing concept for the development of rural community in Khatav Tahsil - a part of society.

Present paper aims to the agricultural drought. Survey shows us that, the public and agricultural situations in the studied areas are worst. Not only for the animals but also for the community too. It is found that most of the families are migrated in the nearby non affected areas during the drought period. Note that the multiple schemes of private sectors are successfully and shows the good results. But coverage of affected area is large and becoming larger. It is seen that existing systems are having lack of support of computing based resources. Note that due to lack of in time availability of resources It is also found that the situations of the human being viz. farmers their corps and cattle's [5] becoming dangerous which may result in to the adversely affecting on the lives and related components in the families too within the society. There is big challenge in front the older villagers, farmers since they cannot migrate.

Drought is the one of the damaging disaster. Because of its slow-onset characteristics and lack of structural impacts, drought is often disregarded unless serious problems appear [7]. This lack of recognition compared to other natural hazards such as floods, earthquake or tsunami [1] has been an impediment for obtaining adequate research support and, in many cases and in many cases it becomes an obstacle for building awareness among decision makers [17] at the local, regional, national and international levels

2. WHY NEED OF PUBLIC PRIVATE PARTNERSHIP BASED DISTRIBUTED COMPUTING IN THE SELECTED STUDY AREA?
It is observed that, there are various aspects about human based decision making in the selected study area (Tahsil) during the drought situation about the general administration. This is to note that in the complete Khatav Tashil and all the villages under the Tashil, there is very negligible rainfall during the last 20 to 25 years. Survey shows us that the large no. of villagers are based on the business as farming[19]. This is the large open land space covered by the hills. There are water sources such as rivers but they are dried since last 25 years. This worst picture pressured the villagers to migrant from this area to some other place in order to fulfill their at least basic needs for the survival. Survey shows that getting adequate drinking water is very difficult situation.

It is observed that, following are some of the limitations in the existing system in the present data communication [2] towards Government and its administration of the villages and the area selected for the study

- Lack of in time information to the local administration.
- Delay in data communication between Govt. departments and the drought affecting area.
- Inadequate supply of materials through the local administration[11] of the Govt. (Panchyat)
- Lack of computing based systems for prediction and assistance.
- Inadequate man power to share the information to the Government sector.

- Lack of adequate resources.

the view of above said limitations, authors feel that, there is need of application of distributed computing model based on PPP system which will share and utilize the resources in varied sectors by means of data communication [20]. Hence it is proposed to design and develop the Public Private partnership based [15] distributed computing model for drought redressing situation in the Khatav Tahsil in the Satara districtSurvey also shows that there is lack of Computing based systems to provide the adequate information [12] in time to the needy users i.e. villagers as a apart of redressing the drought.

3. PUBLIC PRIVATE PARTNERSHIP BASED DISTRIBUTED COMPUTATIONS (P3C)

It is seen that, there are many systems for generation of information to the users are developed for administration of different disasters. But in case of the drought affected area which was studied, it is found that, there is lack of efficient data sharing and information generating systems based on Public Private Partnership.

4. P3C MODEL

Drought Redressing Community mechanism as P3C Model comprises with the following sub modules as components:

1) Public System
2) Private System
3) P3C planning cell
4) Tashil administration
5) District administration
6) Self Help Groups (Bachat Guts) [22]

- Some villages did not get timely information for further decision making

Survey shows that, the population in this affected area is adversely affected with water, money, food for the human as well as to the animals too. This is one of the motives to have implementation of Distributed Computing based model of Distributed system with PPP impact.

3.1 Public–Private Partnership (PPP) means a government service or private business collaboration which is financed and operated through a partnership [16] of government and the private sector business units

Public: The term public is used in general to solve the social problems of the villages in the Tahsils [14]. A govt. user which performs the public activities are mainly aimed here for the study purpose. Every public can be the part of this component

Private: Term private refers to the private business units or companies who have to take the initiative to handle the allocated job of the servicing to the nation as a part of social aspect. The financial aspects in this case must be handled majority by the Private component.

P3C model is based on Public Private Partnership based Computations. Shown in Fig. 1.

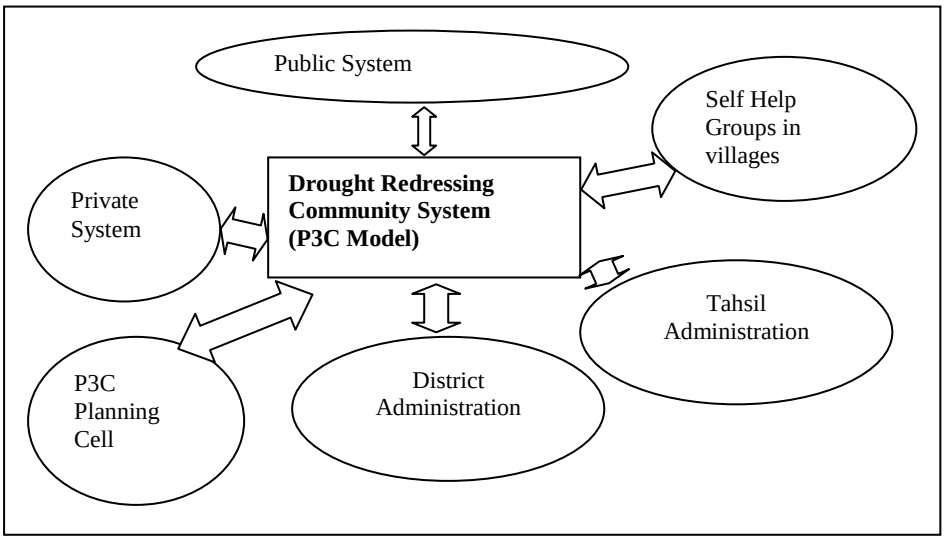

Fig. 1: P3C Model

4.1 Flow Diagram

Fig. 2 shows the working of the P3C Model as flow diagram.

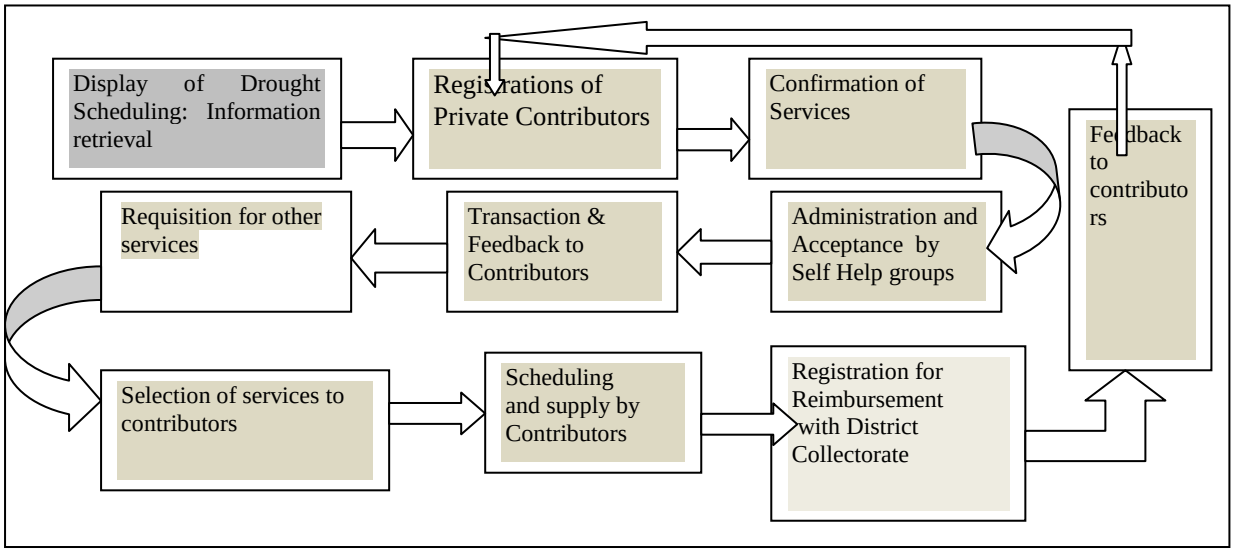

Table 1 shows the users and their contributions or participations on different occasions to contribute or participate my means of different services or contributions to assist the Drought affected community or village.

Table 1: Users- Contributors and the occasions

Sr. No.	Type of Users	Participation on occasions
1	Gram Sevak and Administration of Gram panchayat	Identify the needs of village during the Drought
2	**Contributors :** Private firms, Students Employees and employers Social Clubs	- Policy of Firm as Social aspects - Birthday celebration, Award amount, Scholarship - Donations, Gifts, Food Grains, cloths Water tank -Rotary, Rotaract, Lions
3	Departments	All the depts. : Grampanchyat, Panchayat Samiti, Zillah Parishad, State Govt.

4.2: Drought Redressing Mechanism: P3C Model as Information System

A P3C model as Drought redressing Information System comprises the complete range of information and computing applications for requisite administration and generation of drought related information.

P3C model includes not only monitoring, assessment but also redressing of droughts by production of requisite information in time. In this paper, authors treat the drought as a natural disaster. Here redressing means sharing of the information,

A P3C includes information on practices to manage the droughts and tools for analyzing the presented information as a support to decision making [4].

According to WMO, 2006 [18] many challenges are commonly faced when establishing an effective technological drought monitoring and early warning system.

Information systems should be able to deal with multiple climate, water, and soil parameters by making use of requisite computer networks by means of data communication. This may characterize a drought's magnitude, spatial extent and have potential impact [23]. These types of data are often lacking or incomplete.

4.3: Important Components in the P3C Model

The important components of the P3C Model and its relationship with the District administration is shown in Fig. 3

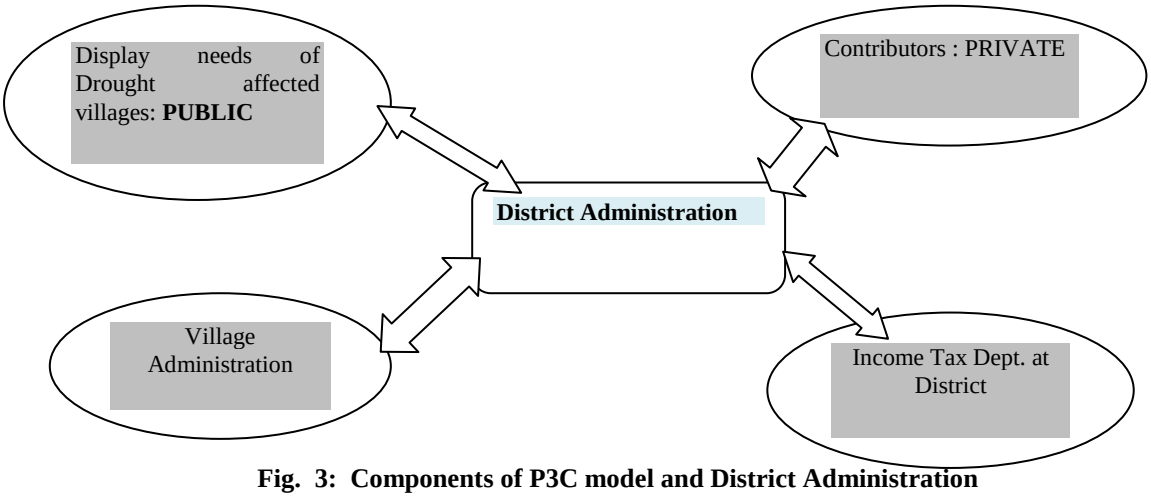

Fig. 3: Components of P3C model and District Administration

4.4: Algorithm

Mathematical representation of functioning of P3C model

1. All the departments and their administration should be connected as shown in Fig. 3.
2. The private contributors should understand the need of affected village/community.
3. Communication of contributor to village administration, district administration and one of the proposed service provider of the government e.g. Income Tax department in the district.
4. Contribution should be in terms of supply of materials, money or service to the villagers and to maintain the record.
5. Confirmation of the receipt of services from Donor/Contributor.

5. ADVANTAGES

Some of the advantages of the P3C model can be:

- A Platform for sharing the information to the administration and private service providers
- Factual data will be exposed about droughts
- Instant availability of the information to the decision making authority
- Opens new door for the private sector and public to serve the society
- Media to give assistance to self-help groups (Bachat Guts)
- Severe effects would not be there after effective implementation of the model.
- Contributors get other benefits from the Govt. as and when required.
- Information delivery through early warning systems to be used effectively by decision makers[6].

6. LIMITATIONS

Following are some of the limitations of the P3C model.

- Need of computational network amongst the users
- Network and data communication amongst villages, Tashil and District administration in 24*7*365 pattern
- Support of E-commerce based facilities to the users
- Need to update the situations of the affected villages by the Govt. officio in the village.
- Due to unavailability of the requirements to the district administration, the model may limit in the timely redressing of the affected villages by means of information sharing [10].

7. CONCLUSION

By means of use of Distributed Computing the authors feel that the administration during the drought period get assisted for the information retrieval and submission kind of activities. Paper suggested a new mode of handling of drought situation by means of P3C model. Govt. departments may help the draught affected community. Authors are sure it will serve the part of society to save the lives of both human beings and the cattle's of farmers.

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