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Effective Participation as Smooth Path to Community Development

A case study of Karmjay water reservoir - Sudan

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Abstract:

The past half a century of governmental efforts displayed disappointing results of failures in sustainability of many community development programmes. Water storages have been constructed by participation of the concerned communities and governmental efforts as tangible solution. Participation paradigm as a method and theory together with demand responsive approach have been tested as research tool to acquire accelerated smooth sustainable community development. Karamjay (Sudan) water reservoir has been studied. The goals targeted are that community services that appeared as due to compulsive needs are more likely to influence group solidarity, creative achievements and sustainability. This study adopts descriptive analytic method, and has reached to many conclusions, some of which are that participatory approach is one of the best theories and research methods used in implementing community development programmes that express demand responsive. The success of constructing Karamjay dam led to smooth change in some cultural traits and values.

Key words: Participation, demand responsive, community Development, reservoir building, change.

مستخلص:

شهدت جهود الحكومات خلال نصف قرن نتائج غير مرضية وفشلاً في استدامة كثير من برامج التنمية الاجتماعية. فقد أنشئت خزانات للمياه بمشاركة الجماعات المستفيدة لإيجاد حلول واقعية وملموسة. أستخدم نموذج المشاركة الشعبية كطريقة ونظرية وأسلوب للاستجابة للحاجات في هذه الدراسة، واختبرت مدى قدرتها لانزال تنمية سريعة ومستدامة. هدفت الدراسة إلى أن خدمات المجتمع التي تقوم والمعتمدة على ضرورة الحاجة لها تقود غالباً إلى تضامن الجماعة، وإنجاز خلّاق واستدامة للمشروع. تبنت الدراسة المنهج الوصفي التحليلي، وتوصلت لعدد من النتائج منها أن أسلوب المشاركة الشعبية هي أفضل النظريات والأساليب في إنفاذ برامج تنمية المجتمع خاصة التي تُعبر عن الحاجات الضرورية. إن نجاح تشييد خزان كرم جي أدى إلى تغيير سلس في بعض السمات الثقافية والقيم الاجتماعية.

1. Introduction:

The pressing need for water has influenced man in his life history. Efforts were dedicated for billions of man-days of labour to obtain it, let alone safe drinking water, or else to combat diseases resulting from water use side-effects. Moreover, the population instability and conflicts around water sources. The present scene in the twenty first century discloses that almost about 33% of the population in third world countries faces acute water shortage; however, large amounts of water drain to seas each year¹.

The problem of water shortage can easily be solved by water harvesting, but the case is far more complicated by the mere fact that people are spreading in vast areas, and most of them suffer acute poverty, added to the huge number of livestock that need access to water. Hence, there is difficulty to alleviate water supply needed by sole governmental efforts and services due to high cost. The past half a century of governmental efforts displayed disappointing results. The drilling of wells cost high as the water-table is deep in most cases and extracted by means of pumping machines. The whole operating system generates many obstacles of fuel shortage, spare parts not found in the near vicinity, inefficient manpower for running and operating the whole system technically and lack of financial capacity². To surpass those difficulties dams, reservoirs and water storages are recommended, but the cost is still high to be implemented by governmental efforts solely. Hence, community participation in water harvesting projects is inevitable to lessen the cost and facilitate their construction, bring in sustainability as well as providing some other social development services.

Community participation enhances and consolidates social development whenever there is high need for certain good (water, health or education services, security and settlement). The more the service provided is highly needed, the more active is the involvement of the community. However, effective community participation in social development determines certain prerequisites. People should feel and realize that the project serves the benefits of the whole group, and that the system does not contradict or disturb their values or rules of consensus on certain issues and culture, thus facilitating social and cultural change with less friction. People should also be consulted and shared in those projects by creative thinking, planning, implementing and operating the system through time. The process stimulates a degree of confidence, sense of ownership and contribution of all without alienating some groups or individuals including women.

From the above demonstration participation has both theoretical and methodological connotations. The research questions, therefore, are:

(¹) Keller, Andrew, *et.al.*, (2000), *Water Scarcity and the Role of Storage in Development*, Research Report 39, International Water Management Institute (IWMI), Colomb, Sri Lanka.

(²) Faillace, Costantino, (Aug. 2008), *Water Development in Semi-arid Land with a Focus on East Africa, Symposium on Sustainable Groundwater Development for Small Villages of Underdeveloped Communities by Simple, Low-cost Technology*. Oslo.

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- a- Can community participation bring in sustainable development without causing social and cultural unrest?
- b- Can the achievement of goals lead to initiation of other community development services, and that each achievement encourages formulating new ones, that is to say, accelerating development?
- c- Are water harvesting projects, through water storages and reservoirs, considered a priority to start accelerated sustainable development and other participatory development projects?
- d- To which extent can the results of this study be a useful experiment to other situations in different regions?

The society is an integrated and interdependent system, and that any conflict may lead to malfunction. The school, the reservoir and the hospital are all based on a land which is property of others. Conflicts occur unless consensus between groups takes place and activated on those issues (decisions). The importance of this research, therefore, is to consolidate cooperation and synergy for the completion of programs which generate trust, mutual respect and facilitates smooth change. Again, the nature of a new programme seeks acquisition of extra skills, and appearance of new roles. These roles often find acceptance whenever they have been coincided with the needs, culture and values of the concerned society, in other words, they stem and agreed upon by the members of the community.

There are many reasons that stand behind the significance of community participation in social development. It helps individuals to understand the dimension of their problem. They can then propose and carry suitable solutions that conform to the social and cultural setting. Hence, developmental changes will not be impeded in the implementation phase of the project as the beneficiaries seek to keep, sustain and make use of it.

The main goals this study tries to achieve are that:

- a- Community services that emerge as demand responsive are more likely lead to group solidarity, creative achievement and sustainability of programmes.
- b- Community participation, as an approach and method, is necessary and effective for enforcement of projects and social development.
- c- Strengthening the participation of the vulnerable and the marginalized segments of the community plays a constructive role in the enforcement of programmes.
- d- Outsiders (the governments and organizations) role is to stimulate, grant, carry technical roles and give priority to community development programs that follow the method and approach of participation.
- e- Participation confirms the importance of endogenous knowledge in community development.

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2. Community participation: an approach and method:

Community participation has been a dominant theme in the literature of development since early 1970s and 1980s. The concept found rigorous discussions in the circles of applied anthropology, applied sociology and rural development planners. Although there is no consensus on participatory approach effectiveness in planning, implementing, management and organization of the programme, new strands have grown confirming its usefulness³. Emphasis has increased due to the shifts in development thinking procedures. The scenario has gone to adopt "development from below paradigm". The advocators of "development from below" emphasize individuals participation in planning, implementing, management and organization of programs. They also seek sustainability of projects; hence, the trend is contrary to the "development from above approach", the centralized standardized task of governments and donors, that dominated the spectrum of development *anti-quem* 1980s.⁴

The different contributions in researching and developing the concept "community participation" brought insight many definitions, some of which are:

- a- "Voluntary contributions to public programmes, but people do not play a role in shaping the programmes."⁵
- b- Involvement in shaping, implementing and evaluating programmes and sharing benefits.⁶
- c- The capacity for influencing decision making processes at all levels of societal organizations⁷.
- d- " A group of people in a locality initiating a social action process that seeks to empower individuals and groups of the people by providing these groups with skills they need to effect change in their own community... it is a people's programme with governmental aid... and not a government program with people's aid".⁸
- e- "Participation as [an end] the empowerment of people to take greater responsibility for their acquisition of skills, knowledge and experience."⁹

⁽³⁾ Rifkin, Susan B. and Maria Kangere, (2002), What is Participation, A participatory Strategy in Africa in *International Journal of Disability, Community and Rehabilitation*, University College, London, p. 38.

⁽⁴⁾ Chambers, Robert, (1994), The Origins and Practice of Participatory Rural Appraisal, in *World Development*, vol. 22, No. 7, p.953

⁽⁵⁾ Chambers, Robert, *op. cit.*, p. 41.

⁽⁶⁾ Chambers, Robert, *ibid*, p. 41. (

⁽⁷⁾ Kelly, K. and Vlaenderen, H. Van, (1995), Evaluating Participation Processes in Community Development, in *Evaluation and Program Planning*, vol. 18, No. 4, p. 373.

⁽⁸⁾ Zadeh, B. Saheb and Nobaya Ahmad, (Jan.2010), Participation and Community Development, in (*Current Research Journal of Social Sciences*, 2(1): 13-14.

⁽⁹⁾ Nissen-Petersen, Erik, (2006), *Water from Small Dams*, The Royal Danish Embassy, (Danita), Kenya, retrieved from www. Waterforaridland.com

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It seems likely that the several definitions made to "community participation approach" as due to variety of development sectors and development fields in general. Based on these notions and the wide range of research fields that community participation approach covers, a number of related families of approaches have been evolved.

"Participatory rural appraisal (PRA)" that has been developed early in 1990s is one of those variants. It is "an approach and method for learning about rural life and conditions from, with and by rural people".¹⁰

A further approach is the "demand-response approach". It considers that a demand for a certain good is impulsive to drive individuals to amalgamate efforts, display choices and take decisions to participate in order to achieve that goal.¹¹

For the sake of sustainability and to overcome sectoral divisions, an approach called "multiple use of water service (MUS)" is evolved. The approach seeks poverty alleviation in areas where people are needy for water for their domestic life, herds, and agriculture. It is also considered a starting or datum point for initiating and providing other community development services.¹²

The evolution of community development approaches generates many new terms, and concepts have also been coined. Although these concepts are differently expressed, they can be lumped together as being referring to developmental actions and processes that are carried by collective efforts of individuals for the sake of the whole group, some of which can be briefly displayed in the following:

- a- Dialogue: It refers to participation of a group of people who come to a joint understanding. These groups are not uniform mass of people since they are grossly different in level of education, power and access to resources, what Kelly and Van called "participatory understanding".¹³ Dialogue therefore, initiates the process of development and facilitates social action.
- b- Partnership: It is the description of different kinds of interaction between different groups, such as governmental departments, volunteers and the local people.¹⁴

The dogma of community participation paradigm is that development cannot be attained unless the individuals of the concerned society participate in different phases of programme implementation. This almost takes place in micro-level societies. Political support is vital to the success of the programme.

¹⁰) Chambers, Robert, *op. cit.*, p. 953.(

¹¹) L., S. Rautanen, *et al.*,(2014), Community-driven Multiple Use Water Service: Lessons Learned by Rural Village Water Resources Management Project in Nepal, in *Water Alternatives*, 7 (1): p.162

¹²) L. S. Rautanen, *ibid*, p. 162.

¹³) Kelly, K. and Van Vlaenderen, *op. cit.*, 371. (

¹⁴) Kelly, K. and Van Vlaenderen, *ibid*, p. 372.(

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Different levels of participants make efforts to achieve their developmental goals. They comprise on the top level governmental representatives, who are the administrators and the technicians among others, the middle steps are made of prominent figures of the concerned group, who are more educated and empowered like leading citizens or religious leaders. There be at the grass-root level the poor, the weak and the illiterate. This is analytically visualized as "ladder of participation".¹⁵The degree of the contribution varies, some effectively participate, others attend but do not contribute. Hence, presence of some of the members of the community does not signify participation, a fact that let some scholars, who deeply think of methodology and analyses, minimize quantitative methods in analyzing those activities.¹⁶This situation stimulates preference of verbal interaction methods such semi-structural interviewing, focused group discussion and observation.¹⁷

3. Water harvesting and developing countries:

Lack of safe drinking water and sanitation in developing countries, especially sub-Saharan Africa, has led some people to live in bad plight and harsh conditions there. Globally there are about 1.1 billion people lacking access to adequate drinking water, while about 2.6 billion fall short of basic sanitation and good hygiene, most of whom live in rural areas.¹⁸ The projection in this situation presents darker image as about two-thirds of fresh water is appropriated for agriculture, and great amount of water is lost by evaporation processes due to ineffective methods of irrigation; this is in addition to the expectation that more than five billion of the world's population will face great difficulties in access to sanitation services by 2030.¹⁹

The burden of bringing water to the resident is assigned to vulnerable segments of the community, who are the women and the children. But the sources of water are along distance from the residence. It is stated that women and girls in developing countries walk a distance of nearly six kilometers a day in order to get water,²⁰ stay there for two to four hours in queue, bring home heavy water containers, and to begin, thereafter, other domestic purposes.²¹ Botswana, Burkina Faso, Kenya and Ivory Coast are cases in point where women spent more than four hours a day to collect water from sources.²²

¹⁵) B. Rifkin, Susan and Maria Kangere, *op. cit.*, p.43.

¹⁶) B. Rifkin, Susan and Maria Kangere, *op. cit.*, p.43.

¹⁷) Chambers, Robert, *op. cit.*, pp. 958 – 989. (

¹⁸) United Nations Population Fund, (August, 2002), Water: A Critical Resource, New York, NY.

¹⁹) Jonah, Cherutich, *et. al.*, (2015), Water access and sustainable rural livelihood: A case of Elementaita Division in Kakuu Country, Kenya, in *International Journal of Science , Technology and Society*, 3, p. 14.

²⁰) United Nations Population Fund, *op. cit.*

²¹) United Nations , Johannesburg Summit , (2002), *Facts sheet, World Summit on sustainable Development*, New York, p. 7

²²) Jonah, Cherutich, *et. al.*, *op. cit.* p. 14.(

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The tasks associated with women and girls hinder their education. Girls students' performance in schools recorded constant or intermittent absence.²³ They sometimes do not even given a chance for education as they are occupied in other missions, namely providing water from the sources and carrying some other domestic works.

The consequences of processes of colleting water from far away source cast also negative impacts on their health. They are exposed to diseases such as malaria and diarrhea among other ones. Moreover, carrying containers full of water for long distances effect their health greatly, especially during pregnancy²⁴. The repercussion of inadequate water is exemplified by the recognition of many water-related diseases.

The scarcity of water and the resulting vulnerability of health status of women and the lack or loss of educational opportunities have led to a deficiency of women's empowerment and privation of participation in their society's associated affairs, including social development.

The loss of educational opportunities and difficult health conditions experienced by women and children due to lack of safe drinking water and sanitation stimulated the United Nations General Assembly to adopt resolution (A/RES/44/292). The resolution explicitly recognized that getting clean water and sanitation are basic for the realization of human rights. As such the General Assembly called on the states to work on the provision of financial allocation, community capacity building and the provision of appropriate technology to obtain water.²⁵ Moreover, the United Nations Millennium Summit in 2000 considered obtaining safe drinking water is one of the Millennium Development Goals, and stated that the world nations should seek to halve the percentage of individuals who have not access to safe clean drinking water and sanitation in the period 2005 – 2015.²⁶

The traditional approach of water harvesting that accelerated pace in 1980s, the decade of water and sanitation, doomed to failure in many regions as it could not achieve sustainability. Governments' role at the time was to implement services as promoters rather than providers by means of participation. It is the adoption of development decisions on higher levels, and that the governments tend to set up new water supply programme services and leave the completed ones without maintenance through time;²⁷ they are sometimes left without finishing parts of the project exemplified by Burkina Faso instance.²⁸ The beneficiaries, on the other hand, have been left without

⁽²³⁾ Jonah, Cherutich, *et. al.*, *ibid*, p. 14.

⁽²⁴⁾ Jonah, Cherutich, *et. al.*, *ibid.*, p. 14.

⁽²⁵⁾ United Nations General Assembly (28 July 2010), *The human Right to Water and Sanitation*, Resolution adopted (A/RES/44/292)

⁽²⁶⁾ Jonah, Cherutich, *et. al.*, *op. cit.*, p. 13.

⁽²⁷⁾ Sara, Jennifer and Travis Katz, *Making Rural Water Supply Sustainable*, Report on the impact of project rules , UNDP-World Bank Water and Sanitation Program, p. 2.

⁽²⁸⁾ Misra, Arun Kumar, (Aug. 2011), *Towards Drinking Water Security in India: Lessons from the field*, Water and Sanitation Program, Roots Advertising Services, p. 5.

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capacity building in methods of operation and maintenance. In fact, they were far away during the period of project construction, and do not even feel a sense of ownership of the project nor do they care about the way it was done.

The implications of the processes of water harvesting in those periods stimulated an attitude of effective participation of the beneficiaries. Hence, they should be incorporated from the onset of the program by expressing demand, determine the purposes of the reservoir that may include human consumption, stock watering and irrigation,²⁹ and participate in planning, siting, construction, operation and maintenance. The impact of reservoir implementation on health and environment should carefully be considered.³⁰

A committee should be established as early as the program is agreed upon. Representation of different groups of the community is highly essential. It should be composed of prominent figures, some educated individuals, the weak and the poor. Women, who are usually responsible in most developing countries for bringing water home, should be represented. This committee may later be converted to a permanent committee for operation and maintenance after project completion.

Operation and maintenance are among the obvert issues to be sought for from the start. Since the beneficiaries are left to their own to carry these tasks in the end, individuals' capacity building in course of project implementation is highly important.³¹

Recognizing the crucial role of reservoirs, small dams and water storage structures, efforts have been made to construct types that conform to the nature of the site and communities' requirements for water. Different types of water storages have been constructed in different parts of third world countries, such as in East Asia, South Asia, West and East Africa and the Andes in South America.³² Some of these reservoirs are small in size, close to point of use and easily operated and maintained, part of them are in the form of pits, others are constructed across the valleys and water courses. They have been described with different nomenclatures. These types of reservoirs face problems of sedimentation. Many countries have adopted water harvesting. The following instances provide some of those examples:

The majority of Kenya population lives in scattered villages. They engage in grazing economies that depend on animal husbandry and rain-fed agriculture, water was obtained from dry river beds, called "sand rivers ". In the past drilling shallow and deep holes have been made to provide water. Although water is obtained, many difficulties

(²⁹) Roaqrk, Philip, et. al., (Nov. 1989), *Developing Sustainable Community Water Supply System, Key Questions for African Development Foundation Applications*, WASH Field Report No. 270, ADF Working Paper Series No. 4, Washington , DC., p. 9.

(³⁰) Sara, Jennifer and Travis Katz, *op. cit.*, p. 3.

(³¹) Stephens, Tim, (2010), *Manual on Small Earth Dams: A guide to siting, design and construction*, Irrigation and Drainage Paper 64, Food and Agriculture Organization of the United Nations, Rome.

(³²) Sara, Jennifer and Travis Katz, *op. cit.*, p.1.

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have been raised. Water table is deep, extracted by pumping machines, and spare parts are not available in the near project area. Some of those water sources were made to preserve large amounts of water on the grounds that the abundance of water reserved might have solved the problem of water shortage to considerable number of people and stocks there. The latter programmes did not consider environmental degradation due to over grazing and rapid over stepping around water source area. It is now realized that the use of appropriate technology by constructing ponds and underground tanks or other types of artificial aquifers is most suitable in semi-arid land, this is in addition to participation of the beneficiaries in the project implementation.³³

In India many regions suffer lack of safe drinking water. This instance can be visualized by the example of Khintala village where about 378 women suffer short of drinking water. There are no water storage or hand pumps, while the nearest water source lies about 2.5 kilometers from the village, and it takes three to four hours to fetch it. To combat this severe shortage the local government through community participation succeeded in implementing several water reservoirs in rural areas. The programme made use of people's innate wisdom together with modern science to provide drinking water, security, and save women's time and efforts.³⁴

To attain water sustainability in Maharashtra in India, the beneficiaries are asked to pay water tax that will be collected by entrusted individuals so as to be specifically used for operation and maintenance of the water storage. This instance of water tax collection has been adopted all over the region of Maharashtra.³⁵

The project of water reservoirs in India sought women empowerment. They had been represented in the reservoir's operation and maintenance committee and income generating programmes. These storages opened new avenues for many self-help groups that were formed to carry income generating activities, the total of which exceeded 2700 enterprise units. The consequences of water programme sustainability that it helps to reduce health expenditures and attain students' regular school attendance, saved about 3.8 hours a day that has been exploited to increase their revenue, in addition to the implementation of some community services including schools and health centres.³⁶

Certain types of rainwater storage reservoirs have been constructed in semi-arid region in the Sudan. They are traditionally labeled Hafeer. It is designed by building a construction in a location where rain water comes up to in the valleys and water courses. The Hafeer is designed to preserve large quantities of water for domestic use and animal watering for the dry season. The most evident problem generated by the Hafeer construction is pollution due to the contamination of water. Normally an outlet is made to a pet or deep hole or storage tank for water to flow in for the use of man. The Hafeer is

⁽³³⁾ Faillace, Costantino, *op. cit.*

⁽³⁴⁾ Misra, Arun Kumar, *op. cit.*, pp. 7-8.

⁽³⁵⁾ Misra, Arun Kumar, *ibid*, p. 16.

⁽³⁶⁾ Misra, Arun Kumar, *ibid*, pp. 17 – 21.

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also fenced to keep and draw animals from entering. The average capacity of the storage ranges from 15000 to 250000 cubic metre. There are different types of Hafeers; the traditional one which is a normal hole dug on ground surface, other ones are built under ground or the lined storages. There are some other types that have been built across the valleys to preserve large quantities of water. They have hybrid characteristics between small dug hole and a small dam.³⁷

There are some famous reservoirs in the Sudan. The Gadambliyya reservoir (Hafeer) in the vicinity of Al-Gadarif city was built to provide water for domestic purposes and stock watering,. The other reservoir is Haloof Hafeer which is located in near Al-Fasher city. It is constructed early in 1970s with earth embankment and central concrete spillway, and with a capacity of about 500000 cubic metres of water. Rainfalls in August 2005 caused severe damage to the reservoir.³⁸ Moreover, Gulou water storage is famous for providing a whole city of Al-Fasher with water. Its population exceeds half a million persons.

4. Karamjay water reservoir case study:

A. location:

Karamjay centre lies about 83 kilometers east of Nyala city the headquarters of Southern Darfur State. It is located about 25 kilometers north east of Shiairiyya city the head of the province, 30 kilometers of Khazzan Jadeed, 15 kilometers of Ghurabbashshay the former seat of the tribes' chieftain, and 20 kilometres south east of Nittaiga. Formerly Karamjay is a small village with population density of about 1000 persons called Krunjay. Its name has been changed to Karamjay after the construction of the reservoir. The new appellation means hospitality. Around it scattered 21 villages which are: Dingiyya, Dalim, Kurtail, Hillat hasab, Dukoor Nazalu, Yuyaye, Sandergay, Dumadya, Shanaabla, Kraib, Brugbrug, Hashaba, Hakkamiyya, Um-Himmaida, Araid, Um-Shool, Miraikha, Mundah, Hillat Al-Baida, Hillat Abdul Raheim Tantunj and Hiwaish.

The research area geology is characterized by sedimentary basin which is made up of Nubian sandstone and Umm Ruwaba formation that have the potential to preserve water supplies.³⁹

The research area is located in semi-arid zone. Water is scarce in many places and people suffer much to collect water from remote places where it is available, and where people assemble to obtain and carry it on animals' backs. It is true that some places are exceptional in availability of water as they are located in rich ground water areas besides

⁽³⁷⁾Misra, Arun Kumar, *op. cit*, pp. 46 - 48.

⁽³⁸⁾ Department for International Development, (25 October, 2007) , *Darfur: Water Supply in a vulnerable environment*, Phase two of Tearfund's Darfur Environment Study, p. 3.

⁽³⁹⁾ Department for International Development, *ibid*, p. 1.

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the banks of seasonal water courses (*wadis*). Karamjay, the case of this study, lies adjacent to a valley (*wadi*) that crosses some of its wards, however, water is scarce. Rain water flows off into the valleys (*wadis*), some water infiltrates deeply, thereby leads to rapid saturation and recharges the basement aquifer of the valley area. The process recurs every year for four months starting from July.⁴⁰

B. target population:

The inhabitants of the villages mentioned before around Karmjay comprise the target population. Although they resemble each other in terms of culture and values, they are originally made of different tribal groups. They are compelled by the pressures of acute lack of water in their areas to think over their situation, and consider questions related to reservoir construction and other outcomes. Economically they depend mainly on dry farming and animal husbandry.

C. methodology:

This study adopts descriptive analytic method to display, explain and interpret the data collected on qualitative bases, which is best to use when participatory approach is accepted as a method and theory. A fieldwork was carried by a research team. Many sources have been utilized to obtain field primary data. Structural focus group interviews were held with fifteen of the inhabitants who have participated in the dam building; this is in addition to three groups of household interviewed on gender segregated focus groups bases. These groups are randomly selected. Other purposive samples were selected for interviews. They are the members of the steering committee that supervised the process of reservoir construction. The mayor (*Umda*, The chieftain) Azzain Bahr Aldeen was interviewed as key figure who initiated and proposed the project, and who have headed the native's steering committee for building the reservoir. Some of the administrators and engineers in Nyala, the headquarters of the region, were also interviewed.

5. Karmjay water storage dam construction:

The majority of the target group obtains water from a thirty metres deep well at Karmjay village before the implementation of the reservoir for a long time not specified by them. They stay sometimes for a complete day in queue, and often wait for water to cluster before extracting since the well is almost silted especially during May and June, and the rest of the groups collect water from other faraway places. In this situation a former headmaster, who was appointed mayor (chieftain) instead of his dead father, thought to change the scene. He proposed construction of water storage dam across the valley, began a dialogue to persuade and convince the inhabitants of the adjacent villages to accept the idea, and to deliver an application for that to local regional authorities in Southern Darfur State. After many sessions these partners reached to terms of consensus.

⁽⁴⁰⁾ Department for International Development, *op. cit.*, p. 1.

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The authorities in the regional state agreed on condition that the beneficiaries and their neighbours through local chieftains in Karmjay, Shairiyya and Ajara pay a sum of five millions Sudanese pounds so that their contribution amounts half the required money. A committee composed of ten men was constituted. They paid their commitment, and a schedule of programme implementation was set up. The roles of each sector, the beneficiaries and the government, are specified. It seems more likely that the necessity and demand accelerated this response and activated participation processes.

Engineers and technicians came early and have determined the site of construction and catchment area. The beneficiaries from all villages assembled to discuss the whole question of water dam construction. Land ownership right is the first to handle since the dam, catchment area and the routes leading to the site are possessions of some people; and associated with land tenure system among the group, and has also to do with social values. Change takes place gradually in the communities, and sometimes it confronts many hindrances that impede its process. It is imperative that it would be hardly feasible to carry change in social values like the codes accepted by the communities in the organization of land tenure system. What happened there is that the land owners made concessions without being paid any price or incentives at the time, but the regional state authorities promised to pay them some lot after finishing dam construction. The instance confirms the credibility of demand responsive approach combined with participatory approach that this study tries to vindicate.

A committee of ten people has been formulated to carry the mission of managing and coordinating the work on the site between the engineers and technicians on one side and the group of beneficiaries on the other. A camp was prepared for the working group in the implementation of the reservoir. Working equipment were provided and food was prepared for the first week. The administrative units of Yaseen, Nitaiga, Mahajriyya, Mirshing, Khazzan Jadeed, Shiariyya, Labadu and Ghurabbashshay brought sugar sacks to assist in the provision of food and to sell the surplus to get money for the establishment of reservoir operations.

People are divided into groups of tens to participate in the different works in dam implementation. Some are asked to load the vehicles with sand, gravel and stones and bring them to the work site. The selection of these materials is made under the technicians and engineers supervision. These actions have decreased expenditure. There were about 300 persons of the workers in the dam implementation worked on paid bases. Some of them were migrants from these villages returned from Nyala city to participate in the construction as wage workers, most of whom are builders motivated by work opportunities. The construction of the reservoir continued for six consecutive months.

After some time the reservoir capacity was unsatisfactory due to excessive sedimentation and the consumption of highly increased number of population. It was estimated at the time that the quantity of storage water should be increased from 2000 cubic metres to 4000 cubic metres. A new partnership came into focus to solve the

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problem of enlargement of reservoir capacity. World Vision, a non-governmental organization, sponsored 500.000 Sudanese pounds to rehabilitate the reservoir.

6. Beneficiaries' participation and accelerated community development:

Manifestations of change began to be notified. No sooner had the working groups in storage dam began to arrive than many services had been plotted close the construction area. Restaurants and tea making shops were erected. The beneficiaries, who used to have their meals at home , tried to have them near the project site in order to save time. Time value has been elevated in the cultural value system ladder.

The beneficiaries began to think rationally of providing basic needs and other services within their domain. They began to depart their villages and settle in Karamjay, where the dam storage has been erected. It is only not so long after the implementation of the reservoir that large numbers of people have settled there. The total estimated number reached approximately 15000 persons, that is to say, it increased fifteen times as much as before dam construction. Change seems to be deep and swift in a traditional community where resistance to change is firm. The land owners made concessions, lowered the prices of their assets and sold them to the new comers who prefer to settle near the dam.

When large numbers of those villages inhabitants have arrived, there grew a tendency to organize their new resident besides the reservoir site. Survey teams were brought to plan the locale. The beneficiaries once again participated to share remuneration of village survey. The house area for each person is 500 square metres, and roads have been surveyed. The arrangement of residents were made according to the cultural setting before departure to the new place. All those who had been residing in a separate village are set to reside near each other, and thus there are many wards in the new settlement in Karamjay each one resembles a former existing village, and have been termed with the name of those villages.

The beneficiaries of Karamjay water storage are farmers and animal breeders. They found that their animals could not be brought with them as their numbers are high exceeding ten for each person in many cases. They are over the carrying capacity of the site. This case brought new obligation to the community. Some of their cattle and goats should be left elsewhere or sold. In fact the culture of those people tries to liquidate their fortune that they obtained from crops selling into animals. But they decided to accept change, to sacrifice their fortune, as they may think, in favour of obtaining water, saving time and effort, and enjoy other basic services. Accordingly many individuals have sold their herds and a few not exceeding two or three were kept, and others preferred to keep them out of in the near skirts of their residence. The stock that have been kept in the borders of their were usually brought to the reservoir twice or thrice a week. New occupations appeared, such as shepherds who work on wage bases.

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Although many deep rooted changes have taken place in that community, over all change is impossible. Those groups kept to carry their occupation as farmers. They have not changed the place or the type of crops usually cultivated. They still produce sorghum (Dura, Dukhun), sesame and broad beans. Since land tenure systems have not yet been altered, the people who migrated to the reservoir area could not obtain other lands for farming instead of theirs in their old village, they were obliged to keep intact their tradition; and change was hindered. In the rainy season those groups depart to settle in their farms for some time to cultivate their crops.

In winter and after harvesting their crops, people usually stay almost with no rigorous work till the next rainy season. Now that they discovered many areas for production in their new settlement, they began to carry some new secondary occupations. Some of the target group began to grow vegetables in the periphery of the reservoir such as okra, tomato, watermelon and muskmelon. Change in the diet system took place. Formerly fresh vegetables were part of the meal in the rainy season, and few kinds are part of the meal through the rest of the year. They were planted in an area adjacent to the house under the care of women, called (Jubraka). The current practices show that vegetables are planted by men, and that the role of women has stopped.

Accompanying this accelerated change in introducing new occupations in Karamjay, brick making started near the water reservoir dam. Instead of thatch the common and sole material for cottage and fences construction, bricks soon began to shape some inhabitants' houses. Different social classes began to be discerned. Dependency on family and relatives decreased, this led to creative thinking among groups to fetch new areas of production, or carry some other vocations as secondary occupations. Camels that have been used for transportation of farm production were sold due to the exhaustive carrying capacity of the reservoir area, in addition to the threatens of thieves and smugglers. In return carts drawn by donkeys or horses substituted those means of transport. Trucks also became available as Karamjay market has flourished.

The economic part of life is not the only affected system, the services also found much care. Participation is the means through which the beneficiaries sought to attain community development. The lessons learnt from storage dam helped them to initiate, organize, operate and implement new programmes in services sector. Hence a two classes and an office were built for a new a school, a health unit service was constructed, a mosque was built; and police office was opened. The market area was surveyed. Girl pupils who spent much of their time seeking water have found ample time to attend school, and boys, who look after herds, have regular attendance in schools as most of those herds were sold. Some of the beneficiaries found some jobs in these community services institutions. Safe drinking water is targeted in Karamjay. Hence four hand pumps wells were implemented in different locations in the village. These wells were dug due to the shallow water table as water infiltrates from the water storage.

Effective Participation as Smooth Path to Community Development

7. Conclusion:

This study reached to the following conclusions:

- a- Participatory Approach is one of the best theories and research methods used in providing and implementing community development programs, especially when there is a sense of ownership of the programme and realization that it serves the benefits of the whole group.
- b- Community development programmes which are based on demand responsive projects especially water harvesting ones, lead to adoption of new and other service projects as they help foster creative thinking.
- c- It is, therefore, not only the application of community participation as research theory and method to generate sustainability and introduce new programmes to accelerate development, it is the combination of that approach with demand responsive approach that can provide the required goals. In other words, it is not the theory, method and research area as the paradigm of community participation depends on, but it must include the research topic which is demand responsive to the beneficiaries that may be called "effective participation approach".
- d- Participation of the beneficiaries supports individuals' solidarity, and increases their active contribution that leads to programme completion and smooth change in some cultural traits and values. It further stimulates ideas to introduce new community development, seeks acquisition of new skills, and opens avenues to play roles that have not been practiced before.
- e- The success of community development projects by community participation leads to the adoption of other new projects, especially if the project is demand responsive. The success of constructing a dam across a valley to provide water in Karamjay village, the case study, led the beneficiaries wavier some of the values associated with land tenure, adhere to decamp for residing in the villages around the project site, live with other groups there. The school, the health centre, the police office, the mosque and the market are but essential needs that Karamjay community has established. Therefore, the more the services pose higher degree in the communities' requirements, the more active is the involvement of the community.
- f- The results of community development programs in Karamjay village can be used in many instances, especially in sub-tropical areas, and that water harvesting operations are the most influential in the acceleration of development processes which need substantial political support and backing from the states.

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