



EMPOWERMENT ASSESSMENT TOOL FOR EVALUATING ICT PROJECTS IN AQUACULTURE

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Abstract

It is widely acknowledged that Information and Communication Technologies (ICTs) have the potential to play a vital role in aquaculture development in coastal areas. Several ICT projects have attempted to adopt these technologies to empower the farming communities through which they gain access to decision making processes. Quality of service is very important for such ICT projects yet very difficult to assess the empowerment in the forms of social, political, psychological, technical and economic due to its diversity, complexity and intangible nature. In this backdrop, an empowerment assessment tool comprises of five factors viz., social, political, psychological, technical and economic was developed based on the literature, interviews and group meetings with users and operators of ICT projects for evaluating the ICT projects in aquaculture. In order to validate the tool we conduct a study on four ICT projects viz., Village Knowledge Centre of MSSRF, Ramanathapuram, Tamil Nadu, Village Knowledge Centre of MSSRF, Pudhucherry, Community Learning Centre of Self Employed Women's Association, Gujarat and Communication Information Centre, Odisha. The

opinions of 88 ICT participants on social, political, psychological, technical and economic empowerment dimensions have been investigated by means of a survey questionnaire. The results revealed that except political and economic empowerment all other factors are visible among the users of ICT projects. The study also revealed that the tool that comprises of five factors of empowerment in coastal areas is useful for analyzing the users of ICT project experiences in these forms of empowerment.

Keywords: ICT, Empowerment, Social, Political, Psychological, Technical, Economic

Introduction

Communication is a social process, designed to seek a common understanding among all the participants of a development initiative, creating a basis for concerted action. With the shift towards a knowledge society, the role of Information Communication Technologies (ICTs) such as email and World Wide Web in *sustainable community* and economic development is becoming increasingly important (Mansell and Wehn, 1998).

Continuous development of ICTs and their applications to economic, political, social, agricultural, and aquaculture processes is creating new opportunities that could enhance the quality of human life. New types of web based information and procurement tool for aqua farmers opportunities, that is, aquachoupal; new types of ICTs project in agriculture such as n-Logue, iKisan, Community Learning Centre (CLC) of Self Employed Women's Association (SEWA), Communication Information Centre (CIC), and Information Village Research Project of M.S. Swaminathan Research Foundation (MSSRF), possibilities to access institutions and governance using online access to information; are just few of the opportunities emerging as a result of the use and applications of ICTs in development. The effective use of ICTs in community development projects has been argued to have many potentially empowering benefits and effects, such as greater inclusion, cooperation, participation and wellbeing (Mahalakshmi *et al.*, 2016 and Milio, 1996). Quality of service is very important for such ICT projects yet very difficult to assess the empowerment in the forms of social, political, psychological, technical and economic due to its diversity, complexity and intangible nature.

Friedmann's (1992) alternative development and empowerment model provided a useful framework for the analysis. This model of empowerment involves local self-reliance, direct participatory

democracy and experiential social learning. Social power requires access to certain bases of household production such as information, knowledge and skills, participation in social organizations, and financial resources. This form of empowerment therefore includes key features of social capital, which has been identified as an essential element of sustainable rural community development (Harrison, 1998).

The concept of political power includes access to the process by which decisions are made, particularly those that affect people's own future. It also includes the power to vote, as well as the power of voice and collective action (Friedmann, 1992).

Psychological power is defined as an individual sense of potency which is demonstrated in self-confident behaviour that often results from successful action in the social or political domains; although it may also result from inter subjective work (Friedmann, 1992). Several researchers have identified self-confidence and self-esteem as essential first steps to empowerment (Anderson, 1996 and Claridge, 1996). Feelings of greater individual control are another important aspect of psychological empowerment (Anderson, 1996).

Friedmann's framework of empowerment is useful because it suggests that empowerment and social change is a multidimensional process which requires analysis at the micro and macro levels of the individual and the community, organization or group, and the interrelationships between them are shown Lennine (2002).

Lennine (2002) identified an important fourth form of empowerment that was labeled technological empowerment. Like social empowerment, this form of empowerment also requires access to information, knowledge, skills and resources. The increasing use of the Internet to access government information and to lobby and organize campaigns on important social, economic and environmental issues, technological empowerment is an important new prerequisite to political empowerment.

In this background, empowerment assessment tool comprises of five factors *viz.*, social, political, psychological, technical and economic was developed and validated based on the literature, interviews, group meetings and survey questionnaire with users and operators of ICT projects for evaluating the ICT projects in aquaculture.

Materials and Methods

Four ICT projects such as Village Knowledge Centre (VKC) of MSSRF, Ramanathapuram, Tamil Nadu, VKC of MSSRF, Pudhucherry, Community Learning Centre (CLC) of Self Employed Women's Association (SEWA), Gujarat and Communication Information Centre (CIC), Odisha were selected for this study because of its significance contribution towards disseminating of agriculture and allied information through ICT tools such as video conferencing, audio conferencing, public address system, and computers and its accessories etc.

The data collected included in-depth interview and group meetings with 70 (N) ICT participants such as users and operators, *viz.*, VKC of MSSRF, Ramanathapuram, Tamil Nadu (20 nos.), VKC of MSSRF, Pudhucherry (20 nos.), CLC of SEWA (15 nos.), and CIC, Odisha (15 nos.) for the development of empowerment assessment tool.

The indicators of social, political, psychological, and technical forms of empowerment were identified from Friedmann's and Lennine frameworks. From the various meanings that the interviewees of ICT participants in coastal areas gave to empowerment, we identified economic empowerment and its indicators like control over income, relative contribution to family support and employment opportunities as essential features that contribute to the empowerment in coastal areas. Economic empowerment ensures provision of training, employment and income generation activities with both forward and backward linkages with the ultimate objective of making all coastal communities economically independent and self reliant. Women's lack of economic empowerment, on the other hand, not only impedes growth and poverty reduction, but also has a host of other negative impacts including less favourable education and health outcomes (Rabayah, 2010). So it is extremely important to ensure that women are economically empowered.

Together with Friedmann's and Lennine indicators of empowerment, and interviews and group meetings, a framework that comprises of five factors of empowerment assessment tool for evaluating ICT projects in aquaculture was developed and validated for analyzing the ICT participants' experiences in these forms of empowerment and the use of ICTs in aquaculture.

Samples of 88 ICT participants were selected randomly from the identified four projects (each project 22 nos.) for validating the

assessment tool. Data were collected from the targeted group by employing a well-structured and pre-tested interview schedule. A five point rated scale was used where a respondent was asked to indicate their response about their statements of experiences. The possible scores were 1 for strongly disagree, 2 for disagree, 3 for undecided, 4 for agree, and 5 for strongly agree. The average score was obtained by adding the multiplication of frequencies with the respective weights and dividing them with total number of respondents.

Results and Discussion

Village Knowledge Centres: A background

Empowering the rural communities by making specific and need-based information accessible to them is the major goal of the Information Village Research Project of the M. S. Swaminathan Research Foundation (MSSRF) (Vedavalli, 2005). It was launched in 1998 in Pondicherry, a Union Territory in South India. This project operates by setting up Village Resource Centre (VRC) and Village Knowledge Centres (VKCs) in the rural areas of Pondicherry. The VKCs that currently have been set up in 13 villages; operate on a hub and spokes model. The hub Centre, Pillayarkuppam, is connected to 13 VKCs with high-end technologies. Out of these 13 VKCs five are in coastal areas *viz.*, Veeranpattinam, Panithittu Periyakalpet, Ganapathychettikulam,

Table 1: Village Knowledge Centre location, year of inauguration and major livelihood

<i>S.No</i>	<i>Name of the Village</i>	<i>Year of inauguration</i>	<i>Major livelihood</i>
1	Embalam	January, 1999	Agriculture
2	Kizhur	September, 1998	Agriculture
3	Veerampattinam	April, 1999	Fisheries
4	Periyakalpet	July, 2003	Fisheries
5	Moorthykuppam	November, 2003	Fisheries
6	Kunichampet	January, 2001	Agriculture
7	Kalitheerthalkuppam	February, 2001	Agriculture
8	Poornankuppam	August, 2000	Agriculture / Horticulture
9	Kanapathychettykulam	June, 2005	Fisheries
10	Panithittu	June, 2005	Fisheries
11	Kurivinatham	November, 2005	Agriculture
12	Thirukanurpet	February, 2006	Agriculture
13	Thirukanchipet	December, 2000	Agriculture

and Moorthykuppam and their major livelihood is fisheries (Table 1). Others are having agriculture and horticulture as their major livelihood.

The Information Village Project in Pondicherry has emphasized the use of multiple media. Knowledge centres in 13 villages are connected by a hybrid wired and wireless network consisting of PCs, telephones, Very High Frequency (VHF) duplex radio devices, as well as spread spectrum and e-mail connectivity through dial-up telephone lines.

The centres are run and maintained by the local men and women. In this project, because of a deliberate decision to give priority to women, more than half the volunteers operating the knowledge centres are women (Arunachalam, 2003). The identified volunteers have been trained in basic computer skills and in maintaining the centres. They have also been trained in hardware in order to solve the simple technical problem in the centres.

Relevant information or content is developed for every VKC through in-depth consultations with the community members. The hub centre has the necessary telephone equipment with which the staff works on the information that is uploaded in the network. The VKC is not only a knowledge centre but also a value addition centre, which generates a number of databases to provide information on government schemes on agriculture, livestock, health, educational opportunities, employment news, market rate for farm products, audio clips related to agriculture, education, market prices, rural technologies, weather including wave height alerts for fishermen, and other information that is useful for the rural communities (Vedavalli, 2005).

Communication Information Centre: A background

ICT based model "Communication Information Centre (CIC)" was developed by IRMA-India, which is one of the division of Odisha State Volunteers and Social Workers Association. The CIC mission is to touch the last person as well as to ensure the full participation of rural, coastal and isolated communities with a priority for women mainstreaming into this development process through ICT (IRMA-India, 2008). The centre is equipped with computers with internet connections, printer, digital camera, web camera, and a small library of books and other materials. The centres are focused on providing information on subjects ranging from government schemes, programmes on various sectors like agriculture and its allied sectors and livelihood etc. It is hoped that, through this intervention the women of Odisha will gradually increase their involvement in various activities such as agriculture, health,

fisheries and aquaculture, which will eventually bring them a wide range of benefits and lead to their empowerment within their families as well as in society in general.

Community Learning Centres of SEWA: A background

The Self Employed Women's Association (SEWA) was established in 1972 as an alternative trade union for women workers from the informal sector. Community Learning Centres (CLCs) of SEWA were established in several districts of Gujarat to provide a range of services and interact with the communities. A CLC is a nodal point for information in rural areas and usually services a cluster of villages through the use of ICTs. CLCs have become sources of power at the village level because of their role in disseminating information and knowledge, based on the needs of women members and the community. Activities and services include storing historical, geographic, demographic, social and economic data, and providing ICT tools, such as computers, Internet and calculators. They further serve as: computer training centres for all women (educated as well as older and non-literate); grain and fodder banks; spaces for daily training sessions for aagewans (grassroots leaders), field workers and organisers; and as spaces to improve women's occupational needs by addressing skill upgrades and new skill learning. The CLC also links with SEWA's rural product marketing organization.

Empowerment Assessment Tool and its Validation

The extent of empowerment of ICT participants' in coastal areas was developed largely by the five factors *viz.*, social, political, psychological, technical, and economic and their corresponding indicators (Fig. 1). These factors are deeply intertwined and interlinked with many cross cutting linkages which imply that if efforts in even one dimension remain absent or weak, outcomes and momentum generated by the other components cannot be sustained as they will not be able to weather any changes or upheavals.

The tool was validated with the identified four ICT projects and depicted in Fig. 2. The social empowerment score was more than 3 in both the VKCs and CLC of SEWA projects. Though the score was 2.4 in CIC project, the respondents revealed that farmers have attended various training programmes organized by the project with the help of other organizations and institutes. This increased their social empowerment in the form of knowledge and skills in various field. In both the VKCs, respondents expressed that women's self-help groups use the system to contact other women's groups with which to share

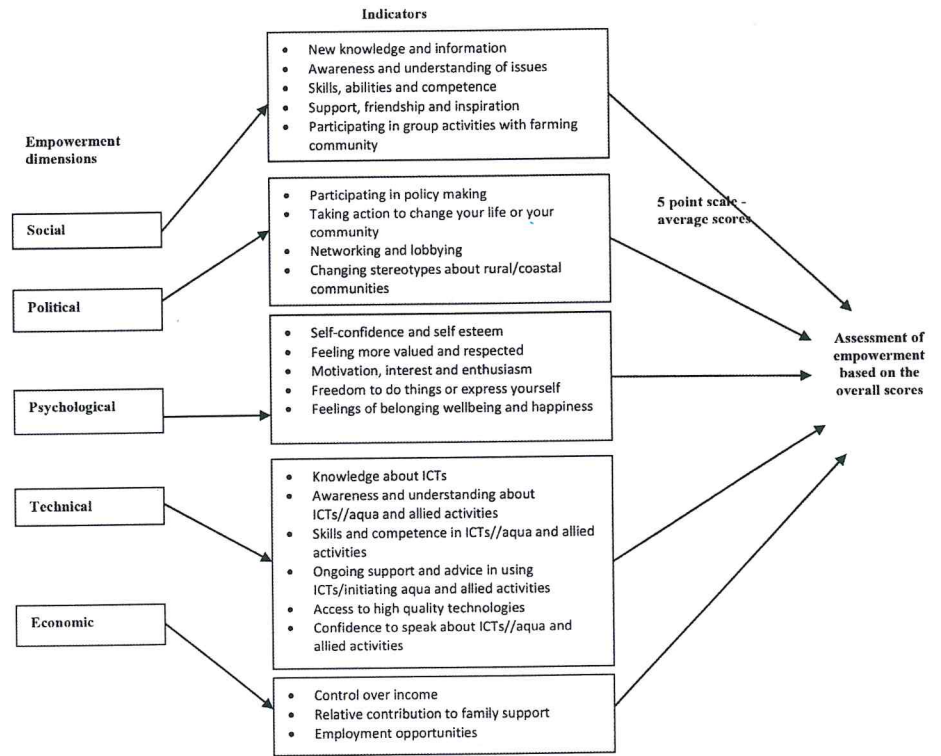


Fig. 1: Empowerment assessment tool for evaluating ICT projects in aquaculture

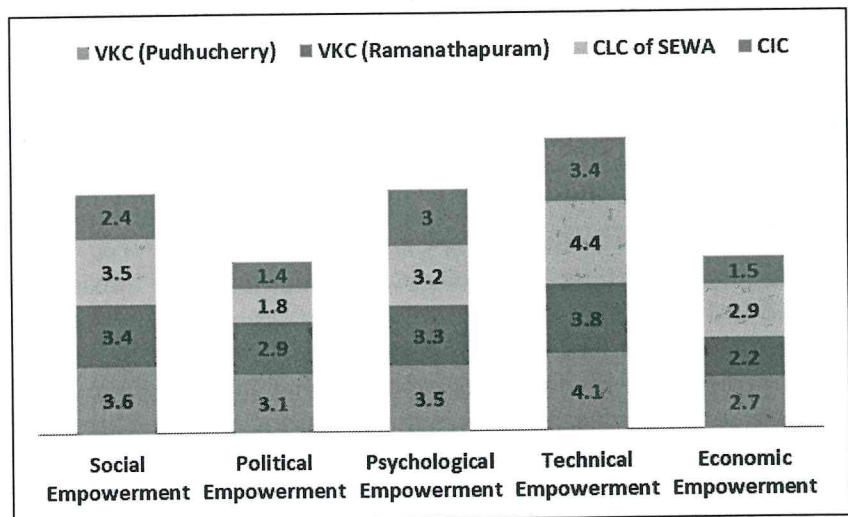


Fig. 2: Average empowerment scores for different ICT projects

their experiences. This builds up the support, friendship among the groups. At the community level, there is overall awareness of various government schemes, their rights and entitlements to several benefits. The fishermen elicit the fishing technologies adopted in other parts of India and the world over information from internet, which would expend their knowledge and skills about their fellow fishermen.

Political empowerment scores are low compared with other empowerment among these projects; however they have become conscious and capable of securing benefits of government welfare schemes for their villages and offering counseling for solving problems. Again, they are involved in conducting regular meetings of women engaged in the project to discuss community-based initiatives. Moreover, they also network or meet people in government and industry and other women to lobby or discuss issues affecting coastal women and to organize various actions. In CLC of SEWA, video screenings, training sessions and group discussions encourage women to take an active role in the public sphere and institutions.

The result shows that psychological empowerment score was more than 3 in all the ICT projects. The VKCs have enabled the women volunteers to gain self confidence and self esteem, and also helped them to reduce their dependence on their men. Participants were also found to express the opinion that they were able to assess their improvement in decision-making. The participants expressed that their ability to think and decide has improved a lot. The participants mentioned that they are able to make their own choices and decisions. They are moving out of their village boundaries and interact not only with women but also with government officials who are mostly men. They take part in meetings and large gatherings, and share experiences with ease and confidence. Participants also gained greater enthusiasm about the use of ICTs for community development. The participants felt that they are respected both at the home and at the community.

The average scores of technical empowerment of all the projects show that, projects have not only produced many ICT literates but have also enabled them to get alternative livelihood options in aquaculture/ fisheries through trainings they got at the centres. All the projects have created a healthy atmosphere of learning and sharing, where children and elders learn computer skills together. In CLC of SEWA, student community has benefited greatly through the centres. Their confidence and learning abilities have vastly improved. The girls feel proud to talk about their computer skills. The VKCs participants mentioned that the

photoshop programme helps them to increase their creativity. Taking part in the projects also provided many participants with varying degrees of technical empowerment in the form of (1) knowledge, awareness and understanding about ICT tools and techniques and their potential benefits and impacts; (2) development of ICT based skills, experience and greater confidence and competence and (3) email and Internet is useful for two way communications between the users. Mahalakshmi *et al.* (2009) highlighted that eliciting information through VKCs have a strong potential because of availability of modern communication facilities.

Though the economic empowerment scores are low in all the projects, many participants among the fishing community have obtained employment using information on employment opportunities accessed through the projects. In VKCs, volunteers at the centre should improve their skills in computer applications which help them earn income. Participants mentioned that after attending the value added training programmes conducted by all the projects, they are able to contribute to the household income by selling their pickles, phenyls, and soaps. Economic empowerment of the volunteers has also been possible wherever there has been opportunity for them to provide services like typing applications, taking printouts, charging for video games etc. ICT projects have not only produced many computer literates but have also enabled them to get employment with the training they got at the centres. Beena and Madhu (2012) stated that ICT empower a woman in various areas like social, educational, personal, psychological, political, technological and economical. Rashid *et al.* (2016) expressed that government should implement e-Agriculture (ICT) based projects on a massive scale for the empowerment of the farmers.

Conclusions

The study revealed that ICT projects are successful enough to disseminate the frequently changing information as well as empowering the coastal communities. The study also revealed that the tool that comprises of five factors of empowerment in coastal areas is useful for analyzing the users of ICT project experiences in these forms of empowerment. The results revealed that except political and economic empowerments all other factors are visible among the users of ICT projects. Only when all the five factors are simultaneously addressed and made compatible with each other the users can be truly empowered.

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REFERENCES

- Anderson, J. (1996): Yes, but is it empowerment? Initiation, implementation and outcomes of community action. In B. Humphries (ed). *Critical Perspectives on Empowerment*. Venture Press, Birmingham, pp. 69-83,
- Arunachalam, S. (2003): Reaching the Unreached, How Can We Use ICTs to Empower the Rural Poor in the Developing World Through Enhanced Access to Relevant Information?. In: *ICTs & Gender: Optimizing Opportunities*, 20th - 23rd August, Kuala Lumpur.
- Beena and Madhu, M. (2012): Role of ICT education for women empowerment. *International Journal of Economics and Research*, 3i3: 164-172.
- Claridge, C. (1996): Women, development and the environment: A method to facilitate women's empowerment. Unpublished PhD thesis, Department of Agriculture, The University of Queensland, Brisbane.
- Friedmann, J. (1992): *Empowerment. The Politics of Alternative Development*. Blackwell Pub, Cambridge.
- Harrison, L., (1998): Using community learning to identify stores of social capital: Have we found the right community?. In: *Learning Communities, Regional Sustainability and the Learning Society*. Centre for Research and Learning, Launceston, 2: 186-196.
- IRMA-India. (2008): *Community Information Centre: Enabling Technology and Empowering Poor in Rural India*. Bhubaneswar, Odisha, India, p.1-47.
- Lennie, J. (2002): Rural women's empowerment in a communication technology project: Some contradictory effects. *Rural Society*. 12(3): 224-245.
- Mahalakshmi, P., Shanthi, B., Ravisankar, T. and Chandrasekaran, V.S. (2016): *ICT aided entrepreneurship development in aquaculture*. In: Sinha, V.R.P., Gopal Krishna, Keshavanath, P. and Nalini Ranjan Kumar (Eds.). *Social Entrepreneurship in Aquaculture*. Narendra Publishing House, Delhi, India, pp. 346-361
- Mahalakshmi, P., Vimala, D.D., Krishnan, M. and Ravisankar, T. (2009): Needs assessment of ICT Users for implementation of aquacultural development projects in coastal areas. *Fishery Technology*, 46 (1): 73-78.
- Mansell R. and Wehn, U. (1998): *Knowledge Societies: Information Technology for Sustainable Development*. Oxford University Press, New York.

- Milio, N. (1996): *Engines of Empowerment: Using Information Technology to Create Healthy Communities and Challenge Public Policy*. Health Administration Press, Chicago.
- Rabayah, K.S. (2010): Economic and Social Empowerment of Women Through ICT: A Case Study of Palestine. *The Journal of Community Informatics*. 6(1), Available in: <http://www.ci-journal.net/index.php/ciej/article/view/500/508>
- Rashid, SMM., Islam, MR. and Quamruzzaman, M. (2016): Which factor contribute most to empower farmers through e-Agriculture in Bangladesh?. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 16 (5): 976-983.
- Vedavalli, L. (2005): *Village Knowledge Centres in Pondicherry: An Anthropological Perspective*. MSSRF / MG / o5 / 19. M.S. Swaminathan Research Foundation, Chennai.

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