How successful is the Wadi model?

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In 1982, the BAIF Development Research Foundation initiated a programme to improve the living situation of tribal communities in South Gujarat affected by environmental degradation and labour migration. In direct interaction with the tribal communities the *Wadi* (orchard) model, which combines improvement of human and ecosystem wellbeing, was gradually developed. Today, over 25,000 families from 300 villages have adapted the model. It is now to be implemented in Maharashtra and Rajasthan to cover an additional 20,000 families. In ILEIA Newsletter Vol.16.1 (pp18-19) the *Wadi* model has been presented and would be useful reading for those interested in a more detailed description. This article discusses the impact of the Wadi model.

Women obtain an additional income from tomato cultivation. Photo: Sharad Mahajan

Assessing the Dharampur Experience

Dharampur is one of the major tribal blocks of South Gujarat (India) situated in the forest. The area covered under forest is 46 % and is declining due to area brought under cultivation (a part of which turned into wastelands) and land used for settlements. The block consists of 237 villages comprising 287,600 people of which 98% belong to scheduled tribes. The hilly region has poor land and water resources as well as infrastructure facilities. The tribal population consists of small and marginal farmers (land holding less than 2ha) and the landless. The farmers use the land for production of food grains. Most of the tribals migrate to urban areas in search of work as hired labour.

The *Wadi* model has been taken up in the Dharampur block since 1995. 11478 families from 145 villages have adopted the model during the last 5 years.

The effect of the interventions was assessed using community based indicators. Focus group discussions with members of Planning Committees (*Ayojan Samitees*) of the Village Development Forums (*Gram Vikas Mandal* - GVK) were organised to develop the appropriate indicators. Discussions were centred around the perception of the community about development, the current situation and their vision. Information on selected indicators was gathered through household surveys, special studies related to cropping pattern, land use, status of development of GVKs and access to services. The overall effect of the model has been assessed through the 'Barometer of Sustainability'. The results are as follows.

Investing in orchard development

The participating families have established orchards on 4260 ha without disturbing the traditional cultivation area. The major part of the orchards are planted on wasteland (18%) and marginal lands (75%). The orchard plantation includes mango and cashew together with multi-purpose forestry tree species along the borders of the orchard. Farmers have planted 225,000 mango trees, 450,000 cashew trees along with 5 million forestry trees.

Almost half of the total area under orchards is treated with appropriate soil and water conservation measures. These include trench-cum-bunds for gentle and medium slope lands and tree platforms with upstream trenches for steep slope lands.

Each family establishes an orchard on their own marginal or wasteland. Core support for orchard development is provided in the form of material (good quality inputs e.g. grafts, saplings of forestry plants, fertilisers, organic manure, farm tools etc.) and training. Considering the long gestation period, the participants are encouraged to work on their own plots for land shaping and aftercare of the orchard. A token cash support is paid to the family for the labour it invests. It helps families to sustain and ensure proper maintenance of orchards. Participants also receive additional support to develop water resources as a group for income generation activities. The support is provided as a partial grant and credit (25%). The costs involved for orchard development on 0.4 ha are about US$450 see table 1.

Table 1: Per family costs for development of 0.4 ha orchard model

Particulars	Cost (Rs.) Material	Labour	Total	Period of support
Orchard establishment	3150	1030	4180	One time cost incurred during first year
Land shaping		3500	3500	One time cost incurred during first 2-3years.
Orchard maintenance	8040	2100	10140	Recurring cost indicated from second to seventh year of orchard development
Water resources development and irrigation	1450		1450	Utilisation not for individual basis but on user group basis
Credit component	On an average 25% of the above costs for income generating activities, water resources development, irrigation systems etc,			
Training and health component	About 5 % of the total cost per family for five years			
TOTAL COST	Rs. 20,000/ -(rounded off) i.e. approximately US$450			

Improved utilisation of land and water resources

The combined effect of orchard development, land shaping and utilisation of available water has led to a change in the cropping pattern.

- Establishment of orchard and cultivation of crops has increased the land use in the range of 30 -75%. About 40 % of the families have taken up winter cultivation (earlier only rainfed agriculture in summer). The visible impact of the cropping pattern change is crop diversity. Major crops cultivated before the programme were cereals (paddy, coarse millets), pulses (pigeon pea, gram), oil seeds (niger). Farmers added new crops: vegetables (brinjal, tomato, chilli, cucumber, etc) root crops (onion, turmeric, sweet potato), watermelon, wheat, banana, etc.
- About 55 % of the families have increased the average paddy area from 0.36 to 0.5 ha. Rice is the main staple food. Growing of other crops for the market is observed in areas having appropriate water facilities. Cultivation of perennial crops is also increasing. This includes coconut, guava, lime, jackfruit, ber, etc. An overall change in the cropping pattern is observed on 51% of the total area under cultivation.

Settlement in own environment

Tribals see orchard development as an opportunity to build some assets in the existing subsistence living condition. They take every care to make it successful. In many orchards, elderly family members are engaged in watch and ward throughout the day. About 55% families have either shifted or planned to shift their houses into the orchards. Thus, a resource once considered as written-off has now become a shelter for life.

Families have not only started building and utilising productive resources but also acquiring new skills. The baseline situation indicated that only 13% of their income was generated from local productive sources and the economy was primarily dependent on labour migration. Orchards have now started bearing fruits, the cropping pattern has changed, the use of inputs (seeds, fertilisers) has improved and subsidiary agricultural activities such as mango grafting, nursery raising, etc are being initiated. This has brought about a complete reversal in the sources of income and about 60 % of the families now generate more than half of their income from local productive resources.

Improved quality of living

Settlement of tribals in their own environment and opportunities for developing own resources is reflected in the improvement of their living conditions. The visible changes are observed in a considerable reduction in migration, self sufficiency in food grains and improved access to safe drinking water and health services.

Reduction in migration. The baseline situation indicated that 85% of the families were migrating for an average period of 68 days. The people engaged themselves in labour work at construction sites, chemical factories, grape gardens, vegetable packaging centres etc. Women migration was also a common feature in the area and was observed in 35% families. This situation has changed and about 76% families have reduced the migration period (of which 50% have stopped migration). Migration of women has also come down to 15%. People now look forward to increase productive sources of income and simultaneously augment their income through opportunities of local labour.

Self-sufficiency of food grains. On an average the families were procuring food grains worth Rs.1680/- annually, constituting 40% of the cash income. Now, the families have directed their efforts towards achieving self sufficiency in food grains. This has been observed as an immediate effect of land treatment. The area under paddy cultivation has increased. More than 93% families have reduced their food grain purchases of which 57% do not purchase any more. In fact 29% families have even generated income through sale of food grains.

Availability of fuelwood. Another significant requirement of families is fuel wood. The families were dependent on forest resources to meet the same. Various fuel-wood species namely *Leucaena leucocephala, Acacia auriculiformis* and *Gliricidia* trees have been planted around the orchard. These plantations can fulfil fuel wood requirements up to 60 % depending on the number of established forestry trees. Promotion of energy saving devices such as improved cook-stoves has slightly reduced the fuel-wood requirement. 26% of the families are using these improved cook-stoves.

Development of support services (Primary Health Service, Safe Drinking Water and Credit). Usually the families had to travel up to 10 km to avail even primary treatment. Travelling within the area is difficult due to lack of transport and infrastructure facilities. As a result, families used to get treatment from traditional healers and Primary Health Centres wherever easily accessible.

Local youth (especially women) trained as Village Health Guides have not only improved access to health care but also made the communities more aware on health related aspects. This is quite indicative from the fact that Village Health Guides have been the first contact for primary treatment. The first trimester registration of pregnant women has increased from 27 % in 1996 to 42 %. Also, national campaigns such as Pulse Polio have succeeded with over 95 % coverage for immunisation.

The only safe source of drinking water available before the programme was hand pumps, as open wells were not chlorinated.

The fruits of the orchard plantation, ready to harvest.
Photo: Sharad Mahajan

Women have learned how to care for the fruit trees.
Photo: Sharad Mahajan

Yet 31 % hand pumps were not functional. Regular chlorination of open wells, awareness generation among families for home chlorination and putting non-functional hand pumps into use through repair and maintenance has ensured safe drinking water to about 80 % families.

There were only two banks in the area catering to the needs of people from 145 villages. The limited availability of resources together with poor access to credit reduced the scope of development. The programme interventions have brought improvements in the existing resources use. The GVMs are empowered to mobilise and manage the resources in terms of savings and credit. Credit facilities for consumption as well as production purposes are now available in 109 villages.

Building local action

The *Wadi* model has become a common thread for participating families and provides them a group identity. A total of 1790 *Ayojan Samitee* members from 143 GVMs are directly involved in the management of all village level activities. Development of the GVM is linked with a feeling of ownership among members, operational regularity and consistency, self-management capacity, resource mobilisation and responsiveness to people's needs. This is seen from actions like establishment of community dwellings, initiation of regular savings, grain banks, organisation of community marriages, literacy classes, collective procurement and sale of produce, etc. The credit facility available through the GVMs has provided easy access to timely and adequate credit to the participants and ensured sustainability of the development in the long run.

Due attention is given to women as well. All the orchards have joint ownership of husband and wife. Women are organised into self-help groups and take up supplementary income generation activities with regular savings and credit. Simultaneously, need based activities to reduce workload and drudgery of women are taken up.

The field functionaries are engaged in mobilising the people and promotion of technologies for common use through demonstration and training. These functionaries, being local, have an advantage of better understanding the people and the village situation. The training and work experience has given them an opportunity to acquire a special status – "a helping hand" in the village and confidence in dealing with external agencies. There are 114 field guides, 111 Village Health Guides, 250 self-help group leaders, 120 barefoot accountants, 71 hand pump technicians, 87 oil engine technicians and a number of nursery technicians.

The strong cadre of local functionaries, *Ayojan Samitee* members and self-help group leaders has boosted the local initiatives and enhanced the management capacity of people.

Score on the "Barometer of Sustainability"

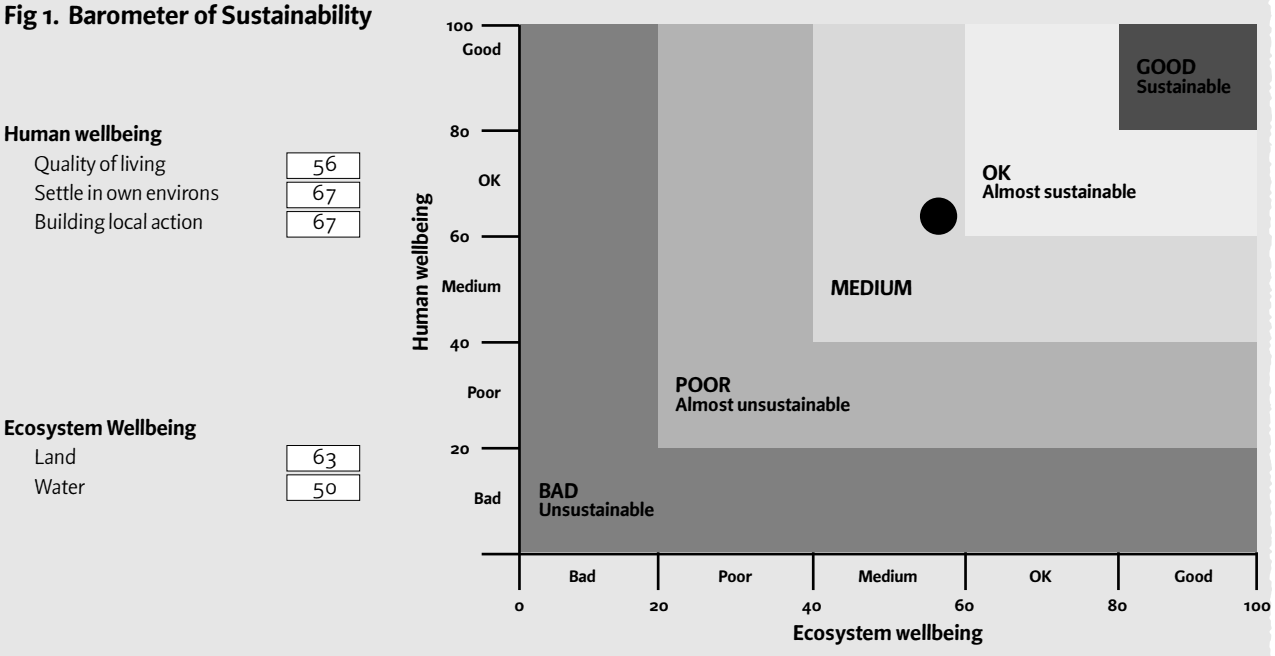
The "Barometer of Sustainability", a tool developed by the International Union for Conservation of Nature (IUCN), is used to combine indicators related to human wellbeing together with ecosystem wellbeing. It treats both people and ecosystem equally on two scale axes as shown in Fig. 1.

The scale is divided into five sectors in an ascending manner from unsustainable (bad) to sustainable (good). Conclusions about conditions of people are expressed as a point on the human wellbeing axis as an index of human wellbeing. Similarly, conclusions about conditions of ecosystem are expressed as a point on ecosystem wellbeing axis as an index of ecosystem wellbeing. The intersection of two points provides reading of overall wellbeing and progress towards sustainability. The tool implies that improvement in human wellbeing should not be at the expense of a decline in ecosystem wellbeing.

Fig 1 indicates the current stage of development in the tribal region of Dharampur due to the model interventions as discussed above. The regeneration and effective utilisation of available resources - mainly land and water - are considered as important dimensions of ecosystem wellbeing. In order to bring about these changes, settlement of tribals in their own environment, changes in quality of living and building local action are crucial and thus these factors are considered as part of human wellbeing.

The intersection of human wellbeing and ecosystem wellbeing scores falls on the border of the intermediate to almost sustainable band with the final score at 60. This indicates a balanced growth at the end of five years. This five-year phase can be considered as a formative phase for reconstructing the resource base and building confidence among the people. The programme has not just remained planting trees but has offered a basket of opportunities to shape the people's future. This is quite evident from actions such as families shifting their houses into

Fig 1. Barometer of Sustainability



the orchards, becoming receptive to new concepts and techniques (mango grafting, nursery raising, composting, appropriate irrigation systems, immunisation, etc) and thinking towards optimum utilisation of available resources. The GVM has taught people to look beyond self interest.

The key to these changes is: linking the development of people and the environment. The synergetic effects of these efforts lead to sustainable development. There is a direct co-relation between the quality of ecosystem and human wellbeing. The status of health, wealth and quality of living are dependent upon diversity, productivity and nature of the ecosystem of which people are an integral part. The wellbeing of an ecosystem depends on people's actions which in turn flourishes people's lives.

Well established cashew orchard of a tribal family. Photo: Sharad Mahajan

Reasons of success

Families, initially sceptical about the interventions, start realising the potential of developing a life time asset soon after seeing the initial results. Planting of trees develops hope in the minds of tribals which further stimulates thinking to make better use of available resources. This becomes the turning point in the life of tribals. Soon families start building check-bunds, nurturing the orchards, land shaping and cultivating new crops.

The regular interaction, exposure to new technologies, visits to innovative and progressive farmers, sharing and learning from one another's experiences increases the awareness and knowledge of people. These actions help build the receptivity to newer concepts and techniques. As a result, tribals once knowing more about harvesting trees than planting them, learn the art and science of plantation and orchard management. Traditional wisdom and the new knowledge assimilated not only helps to establish the orchard but also brings change in agricultural practices, health seeking behaviour and women's status in the family as well as in the village.

The newly found identity as "*wadi* owners" inspires them to come together and the process of development gets a boost through collective action. The GVM becomes the vehicle of "people-owned, people-managed development". Thus, development takes the shape of a mass movement with mass village participation.

A cadre of local field functionaries gets associated with the GVMs to facilitate extension of services in the areas of agriculture, health, record keeping, funds management, etc. The GVKs initiate the process of building resources through savings, credit and support services development (grain banks, agro service centres etc.) to fulfil the people's needs. The increased trustworthiness, credit worthiness and self-confidence enable tribals to gain access and control over resources.

With the passage of time, an entry with a single activity (orchard development) leads to comprehensive community development, individual thinking is replaced by collective action and the tribals once trapped in a dependency syndrome enjoy freedom and power. Thus, the model carves out a new family with the help of already available sources, inspiration and perspiration.

Replication of the model

The time-bound, result oriented model that started with just 42 families, from eight villages in 1982 in the tribal block of Vansda in South Gujarat, is replicated in tribals blocks of Maharashtra, Gujarat and Karnataka covering about 25,000 families from about 300 villages. It is also to be implemented in Maharashtra and Rajasthan to cover additional 20,000 families.

The model has received worldwide recognition. The project was presented as a successful replicable model for poverty alleviation at the UNDP Forum of Ministers for Poverty and Environment in NewYork, USA in 1999 and at the Global Dialogue in Hannover, Germany. Various government agencies in India are now involved in promotion of orchard development and a few of them have supported NGOs taking up the model. BAIF is also engaged in providing techno-managerial support to development organisations. For this it has received the support from Government agencies such as National Wasteland Development Board, National Rural Employment Programme, Tribal Development Department, District development agencies, Banks and various international agencies.

The model has evolved over a period of time considering peoples' needs. Agencies adopting the model should consider its comprehensive nature and use it with suitable changes considering local conditions to achieve maximum benefits. A multidisciplinary team comprising of professionals from agriculture, community health, engineering, social science and extension workers is required to manage the large-scale programmes. It is necessary to develop forward and backward linkages considering resource development and utilisation. These include banks, markets, credit institutions, research organisations etc. The agencies must use participatory strategies, emphasise on capacity building of people, bring in gender development and promote local institution development to achieve sustainable development.

Poor infrastructure limits the pace of development even after successful orchard development. Proper roads, availability of electricity, banking structures, inputs supply centres, market information and development of marketing facilities are the key areas in which government agencies could provide support. Also governments need to mobilise resources to provide long term and timely financial support.

Conclusion

The magic of *wadi* is that it provides self-employment and thereby creates confidence among tribals for self-reliance. It provides opportunities for tribals to make a decent living on the strength of natural resources in their vicinity and within their reach. The *wadi* model has proved that the poor, the illiterate and the oppressed can be idealised through mutual co-operation and collective efforts. ■

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