Sustainable development and natural resource management through community participation in Maharashtra, India: the case of Ralegan Siddhi
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Deutsche Inhaltsangabe (German Abstract)

Nachhaltige Entwicklung und Management natürlicher Ressourcen durch Gemeinschaftsbeteiligung in Maharashtra, Indien: das Fallbeispiel Ralegan Siddhi


umkehrender Migration, sozialer Gerechtigkeit, Überfluss und wahrer Demokratie geführt. Ralegan Siddhi dient als Beispiel und Inspiration für viele weitere indische Dörfer.
Abstract

Finding ways for sustainable natural resource management, especially in the world's fragile drylands, has become of major importance to stop and invert the degradation of resources such as soil and water. This is particularly true in a country like India, where 70 percent of the population still lives in rural areas and 80 percent of the yearly rainfall comes during the monsoon season. Policy makers worldwide have brought forward a number of community-based development concepts and efforts are made to integrate locals into the decision making process to achieve a better sustainability. India owns a long history of village self-governance and modern policies are aiming at restoring this tradition. With the concept of integrated watershed management, where watershed areas are considered as a unit and villagers are participating in the planning and implementation process, a high number of villages were enabled to implement water harvesting and soil conservation techniques and, consequently, improve their agricultural yields as well as their social well-being.

The 2009 Nobel Price Laureate of Economics, Elinor Ostrom, in her outstanding theory on collective action, is challenging the main models of natural resource management and also suggests a more people-centred system, away from central governance, towards complex polycentric structures: various community-based institutions at different levels of governance creating a more transparent and reliable process of decision making. She identified eight design principles that are followed in all sustainable common-pool resource management systems that she had analysed.

The village of Ralegan Siddhi, located in the drylands of Maharashtra, India, and presented in this study, is an example of self-initiated participatory development. After rising from poverty, social degradation and water scarcity into self-sufficiency, Ralegan Siddhi has become a model village for rural development activities and policies. Through a three week long field study, the institutional and social structures, specifics and defects, with a focus on natural resource management, were analysed and elaborated according Elinor Ostrom's method. It is here in Ralegan Siddhi that, under the leadership of 'Anna' Hazare, community participation has led to sustainability, inverse migration, social equity, abundance and true democracy. Leading by example, Ralegan Siddhi has inspired many other communities, such as Hivre Bazare, all around India.
Abbreviations

AGY - Adarsh Gaon Yojana
CAPART - Council for Advancement of People's Action and Rural Technology
CMDR - Centre for Multidisciplinary Development Research
COWDEP - Comprehensive Watershed Development Program
DPAP - Drought-Prone Areas Programme
EC - European Commission
FAO - Food and Agriculture Organisation
FRCH - Foundation for Research in Community Health
GGP - Gram Gaurav Pratishthan
GOI - Government of India
GOM - Government of Maharashtra
IISD - International Institute for Sustainable Development
InWent - Internationale Weiterbildung und Entwicklung gGmbH
NGO - Non-governmental organisation
RLAF - Right Livelihood Award Foundation
SE - Science Encyclopedia
SHG - Self-help groups
UG - User-groups
UN - United Nations
UNCED - United Nations Conference on Environment and Development
UNDP - United Nations Development Programme
UNEP - United Nations Environment Programme
WCED - World Commission on Environment and Development
WHES - World Hunger Education Service
Foreign terminology

adarsh gaon - ideal village
Adarsh Gaon Yojana - Ideal Village Scheme
beedi - South Asian cigarette
dalit - scheduled caste, literally: oppressed
dudh utpadak sanstha - dairy society
gram panchayat - village council
gram sabha - village assembly
Hind swaraj - Indian home-economy
khadi - handmade cotton
lakh - unit in the Indian numbering system (1 lakh = 100,000)
lok sabha - Parliament of India
mahila mandal - women's society
nala - open drain
panchayat – council, literally: assembly ('yat') of five ('panch')
pani panchayat - water council
pani purvatha - water society
phad - block
sarpanch - elected leader, mayor
shikshan prasarak mandal - education society
shramdaan - community labour
swaraj - self-rule
tarun mandal - youth society
vidhan sabha - legislative assembly
zilla parishad - district council
Sustainable development and natural resource management through community participation in Maharashtra, India: the case of Ralegan Siddhi
1. Introduction

Regarding the global situation of natural resource degradation and the rising poverty the notions of sustainable development and sustainable natural resource management are gaining in relevance and importance. Unsustainable farming practices, grazing and fuel wood gathering along with increasing temperatures, drier conditions, shorter and more intense rainfall events due to climate change have led, especially in the fragile drylands covering nearly 40 percent of the world's land area and inhabited by over 2 billion people, to a rapid and alarming depletion and desertification of the natural soils (IISD 2003). Most of the drylands are situated in the developing world, mainly Sub-Saharan Africa and Asia, where villagers depend on their agricultural production to make a living (Ward 2007). They are characterised by limited water supply, variable rainfalls and recurrent droughts. The exploding populations, their rising standard of living and the growing water pollution in these countries are all factors contributing to a growing water scarcity and calling for sustainable soil and water management techniques. (IISD 2003) As Shahaji Phand and H.P.S. Arya (2007) noted in their article on the Indian Adarsh Gaon Program published in the Journal of Rural Development, “[one] of the biggest environmental challenges that developing countries face in the coming decades is to balance their increasing demand with the diminishing availability of water.” (p. 224)

In India, nearly 70 percent of the population is still living in villages. Even today, two-third of the agriculture is rainfed. (Misra et al. 2009) In most areas, the climate is semi-arid and farmers depend on the monsoon season, responsible for over 80 percent of the yearly rainfall, to make it through the very dry summers (Kumar 2009).

Despite a worldwide rising food production and agriculture producing 17 percent more calories per person than 30 years ago, the number of hungry people in the world has been, with over 1,000 million in 2009, as high as ever (WHES 2011). In the fight against hunger, there are, on the one hand, the leading companies of the agricultural sector, who once more come up with new technologies and genetically modified spices to increase agricultural production, and, on the other hand, the environmental activists, the non-governmental organisations (NGO) and self-organised communities looking for more integrated, community-based and sustainable ways of production. As the relation between the rising production and the increasing insufficiency of food clearly displays, the problem of worldwide hunger is not a problem of produced quantity but rather one of unequal distribution. It is initiated by a harmful economic system and people's lack of arable land or income to purchase enough food from the more and more expensive markets. An increased and commercialised production through new technologies will not combat hunger but rather reinforce
the global political and economic structures that are at the root of the problem. They will lead to further environmental destruction and leave small-scale farmers in vicious cycles of dependency for expensive seeds, fertilisers and pesticides, which will be needed to make up for their degrading soil and water resources.

Elinor Ostrom, 2009 Nobel Laureate of Economics, who has dedicated her work to the study of natural resource management systems in order to identify principles that lead to sustainability, writes in her now-classic *Governing the Commons* (1990): “What is missing from the policy analyst's tool kit -- and from the set of accepted, well-developed theories of human organisation -- is an adequately specified theory of collective action whereby a group of principals can organize themselves voluntarily to retain the residuals of their own efforts.” (pp. 24-25) This statement is a call for a natural resource management which is not controlled and governed by an outside authority, but rather by the communities themselves, by the people who make first-hand use of the resources and whose livelihoods are depending on the continuous availability of these resources. This does not only require an analyst to consider the environmental aspects, but proposes an approach that integrates socio-economic as well as democratic aspects into the analysis and discussion. To give the policy analyst a concrete tool to work with, Elinor Ostrom has identified eight design principles that underlie the institutional and organisational structures of all robust and sustainable natural resource management systems.

In search for a more sustainable development and natural resource management, scholars and policy makers all over the world have come up with different concepts of participatory resource management. These are based upon the idea of integrating local communities as decision makers and consequently as rightful owners into the process of their own development. Broadly speaking, however, any natural resource management project or system in which the community is involved can be called participatory. Nevertheless, different terms and definitions, such as participatory development, common property resource management, decentralised natural resource management or local and community driven or based development, have arisen. While in all of these cases the community plays a more or less important role in the development process, people's involvement as well as the approaches that are followed vary significantly. (Menon et al. 2007) In their book on community-based natural resource management projects in South Asia, Menon et al. (2007) distinguish between four main categories:

- Firstly, there are **traditional resource management systems**, which have been kept intact over
hundreds of years in some rural communities. Examples are minor irrigation tanks in the South of India, the so-called *phad* (block) irrigation systems in Maharashtra or tribal forestry or fishery management systems.

- Secondly, there are many *individual systems* mostly developed through voluntary efforts by the communities themselves or by activist groups, such as NGOs. Examples of self-initiated natural resource management schemes are the Ralegan Siddhi and the Hivre Bazar village development models in Maharashtra, which will be regarded in this study. There are numerous other examples of resource management programs, such as micro-watershed development projects initiated by NGOs all throughout India. In these projects, parts of the funding are frequently provided by governments or other external sources; however the communities are empowered to take the decisions and implement the projects by themselves.

- Thirdly, a growing number of *governmental programs* have been initiated to integrate local communities into forestry or watershed management for instance. Examples are the Joint Forest Management in India or the Irrigation Management Transfer in Sri Lanka and Pakistan.

- Finally, there are some State efforts to *decentralise whole governmental units*, along with the rights and control over the natural resources, as it has been attempted in some parts of India by empowering the elected *gram panchayats* (village councils).

The boundaries between the different systems are very unclear. The traditional systems may be the only category in which the full responsibility of conservation and use of natural resources is in the hands of the community. Ribot (2002) combines the second and the third categories as the actual participatory natural resource management systems and clearly distinguishes them from governmental efforts of decentralisation, arguing that community-based programs are defined by the empowerment of the respective community, while the decentralisation process often ends up being a mere shifting of power from one central unit to another. Moreover, most governmental programs work in close collaboration with local NGOs: The governments are providing the financial and technical means while the NGOs organise the community and back the implementation process. Ralegan Siddhi and the other villages considered in this study can be
classified either under the second or the third category.

The village of Ralegan Siddhi in the drylands of Maharashtra, India, has been awarded as a model village of rural development and has been a precursor for later released guidelines and policies regarding participatory natural resource management. It is here that democracy finds a different, more convenient meaning. Villagers are no longer forced to fit into a national, single-edged legislative system, but are enabled to organise themselves in a way that suits the socio-economic situation, the natural conditions and their proper needs. In this way a sustainable and self-sufficient existence and an effective cooperation between the different community members and their natural environment has been established. The development work in the village, which was mainly focusing on water harvesting and conservation techniques, started off in the 1970s through an institutional change that was initiated by Baburao ‘Anna’ Hazare, who returned to his village of origin at a time when Ralegan Siddhi was in a state of socio-economic disgrace, afflicted by severe droughts and extreme poverty and hunger. Ever since, Ralegan Siddhi’s rise to prosperity has been an inspiration for hundreds of other villages in Maharashtra and all throughout India.

The second chapter of this study explains the general context, the emergence and the meaning of the notions of sustainable development and participatory natural resource management and their application in today's world, more precisely in developing countries. Here the need as well as the efforts that are undertaken in order to integrate community participation into the global development process will become clear. The third chapter explains the Indian context: the history, the natural conditions, the political, social and environmental situation, as well as the activities in the management of the natural resources in India and more specifically in the State of Maharashtra. After the area of colonial occupation by the British Empire in India, many efforts were undertaken to implement the idea of self-governance on the village level. These experiences are important in order to understand the relevance of Ralegan Siddhi's late development and will be commented on in this chapter. In using Elinor Ostrom's ground-breaking theory of collective action, which is explained in detail in chapter 4, the study analyses and evaluates, in chapter 5, the institutional and organisational structures, but also the activities undertaken in the field of natural resource management that make Ralegan Siddhi a model village of participatory development and natural resource management. For the purpose of this analysis a three-week field study was undertaken, where villagers and village-leaders, such as Anna Hazare himself, and the main village-based societies and cooperatives were questioned, respectively visited and analysed. In particular, also by building on the personal experience gained during a two month long field work with a local NGO in
the State of Karnataka in the beginning of 2008, the physical water harvesting and conservation structures will be regarded and explained along with their administrative management. The main focus throughout the study is laid upon the two following questions, which will be answered in the concluding chapter 6:

1. *What and how does people's direct participation in natural resource management contribute to sustainable development in Maharashtra, India?*

2. *Does Elinor Ostrom's method find acknowledgement through the case of Ralegan Siddhi?*

Two main hypotheses guide this study. The first one is that the institutional or administrative change in the village of Ralegan Siddhi, which was generated by the arrival of Anna Hazare, involving the villagers in the decision making process, was the initial step to a sustainable development and a change in the practice of natural resource management. The second one implies that this change goes along with a behavioural change and human development or a restoration of human dignity which enters all aspects of the community and which was generated by the empowerment of the villagers to self-rule, self-reliance and self-sufficiency.

The process of analysing the natural resource management system has to be a holistic one, integrating economic and socio-political factors, due to their crucial role to sustainability. Emphasis will however be laid on ecology and the resources soil and water.

**2. General context**

In this chapter, the focus will be laid on the importance of the sustainable management of the global natural resources. Political efforts that were made by the United Nations to harmonise economic activities with socio-environmental concerns will be highlighted, the problems that occur during the practical implementation of policy recommendations and further elaborated ideas and solution will be considered. The general context shall create an awareness for the importance as well as for the difficulty of managing the natural resource sustainably.
2.1. Natural resource management

There are three main types of resources to be distinguished:

1. *manufactured resources*, which are industrial infrastructure, machinery and information networks;
2. *human resources*, which are the cultural means of production; and
3. *natural resources*, which can be harvested and processed and constitute the foundation for the production of goods and services.

In economic terms, resources are also referred to as capital, meaning they are sources of actual or potential wealth which can, by the right use or exploitation, create more wealth (SE, nd).

The natural resources can be divided into non-renewable and renewable resources. Non-renewable resources, such as coal and petroleum, cannot be used in a sustainable manner, as there is only a finite quantity available. Renewable resources, such as trees, hunted animals, agricultural products, but also water, land and soil, could possibly be sustained and harvested indefinitely, as their stocks are naturally reproduced. However, the sustainable management of natural resources requires that the harvesting rate stays inferior to the reproduction rate. Whenever a renewable resource is over-harvested, meaning the depletion is higher than the reproduction, there is a degradation of the resource. (SE, nd)

Renewable, natural resources provide, on the one hand, raw material needed for any production or service and, on the other hand, ecological services in their natural state. These irreplaceable services, such as the biological productivity of forests, the sink of the atmospheric carbon, erosion control, the cleansing of emitted pollutants, the furnishing of animal habitats, etc., mostly have a crucial importance to human survival and are too often ignored by the conventional markets of the industrialised world. (SE, nd) The actual overexploitation of natural resources may have unpredictable long-term consequences on the ecological system and as a result on humanity.

The main natural resources that will be considered in the present study are water, soil and forest. These resources are mostly regarded as a common property, often openly accessible to all and consequently easily become subject to depletion. They serve as a livelihood for every living creature on this planet and have become, in many parts of the world, a rare commodity that needs
to be protected and managed in a sustainable manner in order to regenerate and be available for generations to come.

2.2. Sustainable development

To counteract this depletion of natural resources, the practice of a sustainable development is envisioned and promoted. The United Nations (UN) World Commission on Environment and Development (WCED) defines sustainable development in the 1987 released Brundtland Report *Our Common Future* as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

1. the concept of *needs*, in particular the essential needs of the world's poor, to which overriding priority should be given; and
2. the idea of *limitations* imposed by the state of technology and social organization on the environment's ability to meet present and future needs.” (p. 43)

The essence of sustainable development is the understanding of the interconnections between the environment, economy and society. As figure 1 demonstrates, it includes economic growth paired with the protection of environmental quality and social equity, each reinforcing the other. At least in theory it leaves behind the assumption that the interests of economy and the environment are facing an endless conflict and accepts that a long-term economic progress will only be possible through environmental responsibility.

![Fig. 1: Pillars of sustainable development (DHK, nd)](image)

Various definitions of sustainable development require that we look at the world as a system of time and space. To make development sustainable we have to keep in mind that the actions done today will cause reactions in the future and that environmental problems arising in Europe, for instance, may have an effect on the air condition in Asia. (IISD, nd a) In this regard, it is important to note, that the achievement of global sustainability starts at a local level. Policies as well as projects and activities have to be adjusted to local conditions, considering materials, tradition, needs and
preferences of local communities (Braungart and McDonough 2009).

Moreover, the idea of sustainable development is closely linked to human development: on the one hand, basic human needs, such as nutrition, shelter and clothes, education, health and safety, but also the realisation of potential, self-fulfilment, participation, autonomy and identity are prerequisites for sustainability; on the other hand, these qualities can only be adequately provided on a long-term basis, in an integrative, sustainable environment. Education, awareness and the sense of belongingness are playing an important role in the realisation of a sustainable future. Sustainability in a particular environment starts with the actions and interactions of people directly depending on the environment.

2.3. Policies of sustainable development

The foundation for a global environmental discourse was laid in 1972 in Stockholm on the United Nations Conference on the Human Environment. In 1983, the United Nations created the WCED and, four years later, they released the landmark report *Our Common Future* which warned the world of the possible consequences of the actual environmental damage and presented the challenge of sustainable development.

In 1992, at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 178 governments voted and adopted common principles and a global action program, the Agenda 21, to counter global warming, alleviate poverty and conserve life sustaining resources for future generations. The programme was to be adopted globally, nationally and locally by UN organisations, governments and other groups of people affecting the natural environment. It gives the primarily responsibility to national and local governments to take considerable policy reforms towards a more sustainable development but, at the same time, emphasises the importance of a global partnership. (UN 1992, Chapter 1)

The Agenda 21 acknowledges the idea that a long-term economic process will only be possible if it goes along with environmental protection. Further it pleads for the consideration of local conditions, the knowledge and culture of concerned communities and their integration into the planning process. Local people need to be given access to land and natural resources. Sustainable development can only be guaranteed through their empowerment, providing them with better education and related training. (UN 1992, Chapter 3)
The UNCED introduced a number of new actors from different business sectors, NGOs and other groups into international discussions and negotiations. Globally it raised the consciousness of seeing the environment as a fragile and finite entity and initiated governments to create and adopt various action plans towards a more sustainable future. (IISD, nd b) However, it has not yet managed to bring the actual destruction of natural resources to a hold. The deep-rooted economic as well as political structures with their complexity and interrelationship are hard to change in such a fundamental way that they could operate harmoniously and sustainably.

2.4. Natural resource management and sustainability in developing countries

Even though sustainable development became, after the 1972 Stockholm Conference, the heading of most development policy papers worldwide, needed institutional changes and appropriate concepts are long from being adequately adopted to guarantee their proper implementation. Self-interest and perverse incentives of donors, corruption among receiving individuals, organisations and institutions are some, but obviously not the main reasons. In developing countries, the main barrier to sustainability seems to have been imprinted on the practice of development by colonial governance and is often enforced by foreign assistance programs. The engagement of the industrialised countries in development projects all around the world introduced the technocratic and bureaucratic, centralised ways of operating into diverse and unknown social and cultural environments. As a result, the conflict between economical process and environmental sustainability has become a worldwide phenomenon. (Ostrom et al. 1993)

While the European reconstruction effort was successfully building on an intact and understood social infrastructure, the years of colonial governance and the foreign assistance efforts that started in the 1950s failed to have a positive effect on environmental as well as socio-economic structures of the developing countries and to effectively address the needs of the indigenous populations, mainly the poor. Instead of considering the distinct social structures, institutional arrangements familiar to those of the decision makers were put into place to facilitate their actions. (Ostrom et al. 1993) Particularly in agricultural and rural development, the over-centralised, bureaucratic and technocratic approach to governance and development has ignored local communities, their administrative structures, knowledge and cultural diversity. (Menon et al. 2007) Inappropriate designs have repeatedly destroyed indigenous social and institutional infrastructures and have reinforced social inequalities locally as well as globally (Ostrom et al. 1993). The integration of
development into an open, competitive market may have a positive effect on the overall economic output of a country, but fails, in the pursuit of profit maximisation, to achieve the desired redistributional goal and to manage the natural resources in a sustainable way.

As modern development projects are mostly designed and funded, constructed and later operated, maintained and used by different actors, different groups with unequal interests and incentives become interdependently involved in the same projects. Those who invest resources in form of capital, time and labour are often not the targeted beneficiaries, but logically expect returns from their investments. The more groups with varying incentives are involved, the more complicated the relations will be. (Ostrom et al. 1993) There is no direct link between the actual decision maker, the beneficiary and the bearer of costs. If proper organisation and distribution of mutual responsibilities among the different stakeholders are missing, each party will look for others to come up with maintaining activities. Free-riding, benefiting from an infrastructure on the cost of others, will become a common practice. In the case of an investment, however, where ownership is created and the users themselves derive the benefits and bear the costs of maintenance, they are expected to keep investing as long as the returns are positive. (Ostrom et al. 1993)

Centralised development schemes, characterised by their hierarchical relationship, inevitably create an asymmetry of information among the different stakeholders and consequently lead to a prevalent abuse of power and opportunistic behaviour. An asymmetry of information systematically occurs whenever one party is instructed to undertake activities on the behalf of a principal. A recipient government can as a result get away with corrupt behaviour such as money laundering as it control the information about local conditions. This kind of top-down approach to development automatically favours the decisions taken by the development planner and disregards the voice and knowledge of the local community. (Ostrom et al. 1993)

Most externally driven development projects are highly technocratic, imposing modern designs on traditionally based communities. Experience has shown that designs that are not in tune with the believes and values of local people hardly find acceptance and are doomed to failure. This implies that, besides having the needed technical knowledge, the development planner needs to be aware of the specific characteristics of a community and its location. In a foreign assistance programme the acquirement of these informations is a time-consuming and costly activity and, as a result, often disregarded. Already in 1945, Friedrich A. von Hayek, 1974 Nobel laureate in Economics, wrote “that there is beyond question a body of very important but unorganised knowledge which cannot
possibly be called scientific in the sense of knowledge of general rules: the knowledge of the particular circumstances of time and place.” (Hayek 1945, p. 521) Arguing that this kind of informal knowledge cannot be put into a statistical form by any central authority, he suggests that “the central planner will have to find some way or other in which the decisions depending on them [the circumstances of time and place] can be left to the ’man on the spot’” (Hayek 1945, p. 524).

Concluding, it is safe to say that modern development projects have proven to be inefficient whenever decision makers are not acquainted with local conditions or local communities are not sufficiently integrated in the process. In this regard, charity or donor projects, failing to build on indigenous knowledge and institutions end up taking away ownership from the recipients, leading communities into an even higher dependency on outside assistance (Hazare 2003).

2.5. The concept of community participation in natural resource management

In so far as the need to undertake reforms, away from centralised, externally-driven development schemes is recognised, efforts are made to integrate social as well as the environmental components into the process. Policies are increasingly focusing on participatory, community-based practices which support an active integration and an equitable treatment of all members within a community. Instead of imposing development projects on a local level, national governments are activated to come up with general frameworks, enabling the flow of knowledge and consequently increasing the capacity of local people to take development decisions in their own hands.

Different guidelines on integrated planning, from organisations such as the UN Food and Agriculture Organisation (FAO), the European Commission (EC) or the World Bank, have been put up to facilitate the process.Binswanger-Mkhize et al. (2009), in their guide *Scaling Up Local & Community Driven Development* describe the vision of South Asian pioneers of local and community driven development as followed: “Local development should be planned and managed by local citizens, their communities, and their local governments within a clearly defined decentralised framework that devolves real power and resources to local governments and communities. Capacity support would be provided by technical institutions and sectors, and non-governmental organisations.” (p. 1) Today's idea of community-based development suggests an interactive partnership between the government and the civil society. It integrates the idea of grass-root participation in a political framework involving all community members in the negotiation process. Policies are supposed to be formulated according to the needs of the citizens. This requires
that institutions are strengthened and that mechanisms are created to facilitate the people’s participation in planning, management, monitoring and evaluation systems. (FAO and UNEP 1999)

Some of the key factors presented in the guidelines are as followed:

- **Self-governance:** As local people know best the environmental challenges that are to be met at a specific place and time as well as the strengths, needs and vulnerabilities of their own communities, they must be empowered to make informed decisions and manage their own land. In the first place, self-governing institutions, represented by locals, must be either strengthened or brought into being to organise the community and function as a mediator between national or State governments and the local people themselves. These institutions must make sure that the information and technologies are available to villagers and that there is the capacity to properly use them. Needed information may concern resources, technology, living conditions, needs and objectives of other stakeholders, information about institutional and legal framework and about economic conditions. (FAO and UNEP 1999) In considering the objectives of the stakeholders, it is the duty of self-governing institutions to make sure that different interests are equitably taken into account and to set priorities when conflicts arise. In participation with all members, shared local norms and rules should be formulated to make sure that everyone is on the same track and to guarantee the internal, self-supported monitoring of activities (Leibenstein 1983).

- **Local ownership:** All stakeholders, including women and vulnerable groups, should be integrated in the administrative process and given the possibility to get involved in income generating activities. Establishing local ownership will raise creativity and initiative, and finally translate into an increased responsibility among the stakeholders, which again will bring about a better overall community performance. (FAO and UNEP 1999)

- **Capacity building:** The need to provide villagers with the skills to take on responsibilities and guarantee the sustainability of the projects is critical. These skills can be acquired through training in important themes such as health and nutrition, agriculture and environment, energy and transport services, water resources and sanitation, business and communications. A common examples in developing countries are the numerous self-help groups (SHG), mostly represented by women only and organised by local NGOs. Villagers
are enabled to take care of their own well-being and housekeeping and to make use of local materials and simple technologies to build small-scale infrastructure facilities by themselves. Modern science and technical knowledge shall not be ignored, but adjusted to local circumstances in order to find solutions that are most sustainable while fitting to local needs and know-how. (Ostrom et al. 1993, Hayek 1945) Experience has proven that small-scale, rural infrastructure facilities, that have been built by the users themselves, are mostly more effectively operated than others. (Ostrom et al. 1993)

- **Community building:** Successful participatory development actually assumes a change at all decision levels, from the policy formulation on the national level to the organisation of every single family within a community, and an effective interacting between all stakeholders. This is a task that can only be accomplished through long term effort, changing institutional and administrative structures from the ground up as well as creating awareness among the stakeholders. The participatory approach is not realised by following a set of technical skills. It should rather be understood as an attitude which actively integrates the people as subjects, not as objects, making the learning process as much important as the outcome. (EC 2004) In most development countries, NGOs play a crucial role in bringing about these new concepts, the information and knowledge to the people and in mobilising the communities. This will lead away from the actual top-down approach, which imposes laws and regulations on citizens, to a bottom-top combination, where citizens will be part of the decision-making body and design the development process of their own village by themselves (FAO and UNEP 1999). The establishment of social equality in strong communities will create self-sufficient, self-governing villages with village-based organisations and institutions, instead of merely incorporating a set of individuals into a predetermined framework.

The development and strengthening of these key factors of community-based development will entail a downward directed accountability, shifting administrative as well as production power from a small number of individuals over to the masses. This in turn, properly performed, will strengthen confidence, self-determination and trust within a mobilised community that takes on their own matters of concern.
3. The Indian context

To understand the historical and political importance of the model of Ralegan Siddhi, it is necessary to look at India's history, her development through the colonial time and the independence movement as well as today's environmental, socio-economic and political situation. India has brought forth many well known personalities and movements with considerable visions for local as well as global development. Mostly, these visions and ideologies did not find their arguably well-deserved breakthrough on the political agenda but they have definitely gained in importance and have increasingly be considered facing today's global challenge of sustainable development.

3.1. History, culture, political and socio-economic situation

India is the keeper of one of the world's oldest civilisations, reaching back more then 5000 years. With the invasion of Aryan tribes into the Indus valley, today's Pakistan, around 1500 B.C., the religious and cultural system as well as the caste system emerged and the corner stones for the first trading towns and significant trading lanes were laid. Between 500 B.C. and the British colonial rule in the 18th century, the country was repetitively conquered and reigned by many different tribes and emperors. This has led to a high ethnic and cultural diversity within the present Indian population. British dominance in India began in 1757 and was ended through the independence movement led by Mahatma Gandhi in 1947. During the declaration of independence, disagreements have split the country into India and Pakistan. Later, Pakistan has been divided into Pakistan in the north-west and Bangladesh in the north-east. (InWent, nd)

Despite the highly visible ethnic and religious diversity and many conflicts within the country, India is often referred to as the world's largest democracy, with a population of more than 1.1 billion. After decades of political dominance of the Congress Party, which led the independence movement in the early 20th century, today's national government is characterised by multi-party coalitions. The two largest national parties are the Bharatiya Janata Party and the Congress Party. Other important parties are the Bahujan Samaj Party, the Communist Party of India and the Marxist Communist party of India. (InWent, nd) With the government's effort of decentralising power to the third tier of governance and the evolution of the Panchayati Raj System over the last decade, strong regional parties have emerged. (EC 2007)

The population density is with nearly 350 habitants per km² relatively high, however dispersed very
unevenly. Agglomeration in cities and fertile regions such as the Ganges valley, West Bengal and Kerala is very high. At the same time the northern hill regions and the dryland areas in Rajasthan and on the Deccan plateau are lowly populated. (InWent, nd)

Economic reforms have led to a rapid growth of the service and industrial sector. However, the vast majority of the country's population remains untouched by this progress. The 2004 UN Human Development Report states that 35 percent of the Indians live on 1 dollar a day and 80 percent on less than 2 dollars. As a result, the gap between the rich and the poor, as well as between urban and rural areas, is increasing. With 65 percent of the population employed in the agricultural sector, rural reforms are crucial to reduce poverty. The population remains characterised by a huge disparity of opportunity, mainly in education, health care and economic prospects of women and other vulnerable groups. (EC 2007)

Often called the country of extreme contrasts, India has a rich diversity of languages, religions, landscapes, etc. Tensions between different ethnic groups and castes frequently lead to political conflicts. The scheduled castes and tribes (lower castes, previously called “untouchables”) account for one fifth of the population. Extreme abundance, a fast growing technology and film industry oppose extreme poverty and neediness, which causes a significant social instability within the society. (InWent, nd)

3.2. Natural conditions

On a north-south span of approximately 3,200 km, India has desert areas, tropical rainforests, the highest mountain range in the world – the Himalayas – and round 7,000 km of seashores. Consequently, India has a very rich biodiversity. With exception of the Himalayas, most areas are dominated by a subtropical continental climate. In the south as well as in the coastal areas the climate is more or less tropical. The months of April and May are extremely hot and dry. The rainy monsoon season is between June and September. Starting in the south, the monsoon moves north and ends back in the south. As a result, the rainy season is considerably longer in the south than in the north. 80 to 90 percent of the yearly rainfalls come during the monsoon season. (InWent, nd)

Thus, the outcomes of the monsoon play a crucial role for the country's agricultural production.
3.3. Environmental problems

The economic development along with the exploding population has put an enormous pressure on the natural resources. This is of special concern for the high number of people economically tied and relying on the natural resource base as their livelihood and has led to high emigration rates from villages into cities, where desperate villagers are hoping to find jobs. As a result, village populations are shrinking, while the slums around the cities, where today a fifth of the Indian population lives, are constantly growing. Here, environmental problems are most obvious. Extremely high air and water pollution, noise exposure, the absence of waste and sewage disposal as well as missing sanitary facilities leave behind a disastrous impression. (Dembowski 2001)

Because of India's high dependence on the agricultural production however, environmental damages of major concern are caused in the agricultural sector in rural areas. The most vulnerable and endangered resources are soil, water, forest and the biological diversity as well as the genetic potential of plants and animals. The main problem for the Indian agriculture is the high soil salinisation caused through the arid climate conditions along with inappropriate irrigation techniques. With precipitation rates being lower then evaporation rates and rainfalls being restricted practically only to the months of the monsoon, a second crop can only be achieved through irrigation. (Zingel 1998) According to J. Mohan Rao (1995), in 1995 60 percent of India's agricultural lands were degraded. Today the number is estimated to lie over 70 percent.

Another significant environmental damage in rural areas is the deforestation, and the related erosion and shortage of drinking water. Up to 150 million Indians are depending on the scarce forests as a source for firewood and fodder. The resulting depletion of forests causes erosion, hampers the cultivation of crops, and makes the rainwater run off instead of allowing an on-site percolation and the recharge of the groundwater level. (Dembowski 2001)

3.4. Environmental policy

In a country like India, where 300 million people live below the poverty line (UNDP 2004), environmental protection is often regarded as being a stumbling block for economical growth. The main questions in the political discourse have rather been of socio-economic than ecological nature. However, the international discourse on the sustainability of the economic system and the limits of economic growth have found their way to the fore also in India. The questions that should be asked
are “whether today's economic growth comes at the expense of tomorrow's economic growth” (Zingel 1998, p. 68)1 and how to safeguard the livelihoods of more then half a billion villagers.

It was the earlier mentioned Stockholm Conference of 1972 that brought the conflict between economic growth and environmental sustainability on India's political agenda. Indira Gandhi, the country's Prime Minister at that time, returned from the conference determined to bring forward the environmental movement in developing countries. Many acts, such as “The Water (Prevention and Control of Pollution) Act” in 1974, “The Water (Prevention and Control of Pollution) Cess Act” in 1977, “The Water (Prevention and Control of Pollution) Rules Act” in 1978, “The Air (Prevention and Control of Pollution) Act” in 1981 or “The Environment (Protection) Act” in 1986, were passed. In 1985, one year before the German Ministry for Environment was established, the Indian government launched the Ministry for Environment and Forest and many successive 5-year Environmental Action Plans have been composed and passed. (Dembowski 2001)

Based on the federal system, the government pointed out the importance of a decentralisation of the environmental activities and the need for education, training and cooperation with the concerned communities. The 8th 5-year Action Plan (GOI 1992 a), passed in 1992, says:

- “1.4.32 Environment, ecology and development must be balanced to meet the needs of the society. In the interest of sustainable development it would be necessary to take measures to preserve, conserve and nurture, the fragile and critical eco systems. There is a need for a decentralised approach in this area as well, so that the environmental considerations are taken note of in every sector with a definition of the appropriate technology and environmental options while formulating programmes and projects.

- 1.4.33 Environmental management principally includes planning for sustainable use of resources, protection and conservation of ecological system by education, training and awareness. Cooperation of both governmental and non-governmental organisations should be called for at all stages if environmental movement is to achieve success. It can only be accomplished with the fullest cooperation of the people.”

Even though there is a high number of acts and rules concerning the environment, the establishment

1 Quotation translated from German original.
of a proper cooperation between the different institutions on the various levels of governance has proven to require more effort than the mere imposition of legislations. The roles of the different actors are unclear and, in many cases, governmental activities were the main origin of environmental damages. (Dembowski 2001)

3.5. The Panchayati Raj System, British rule and Gandhi's vision for an independent India

The Panchayati Raj System, first mentioned about 3,000 years back in the Hindu scripture Rig-Veda, is a traditional system of institutions consisting of five members. It was the aim of these institutions to guarantee the self-governance of villages. Unlike the envisioned idea of the modern Panchayati Raj System, these counsels used to be dominated by the heads of the higher castes and religions and were mainly concerned with social and religious matters. (Rürup 1999) In his study on the panchayat (assembly of five) tradition, Mario D. Zamora (1990) describes the main benefit of this system of governance with cogent democratic arguments concerning the management of land and revenue distribution within the village itself. The availability of small-scale governmental units at the local level facilitates the people's participation through the existence of a more personal relationship between citizens and the respective government.

It was only during British colonial rule that the natural resources, previously belonging to the communities themselves, became state controlled. The traditional village headman and the accountant, paid directly by the villagers' revenues for governing their resources, became paid government servants and the villagers in turn had to pay their share, in higher rates, to an unknown group of leaders in the state's headquarters. (Zamora 1990) This process leading to compulsory acquisition of land and resources began around 1860 when the British decided to turn the forests into a source of state revenue and exploited them for their commercial and industrial use. In 1894, they established the Forest Department and set an official end to the healthy people-centred natural resource management and the long established, sustainable relationship between the resources and the tribes and rural populations who were, and still are, critically dependent on the environment for their own survival. Bringing common property resources under the control of centralised bureaucrats and putting them at the service of powerful political leaders and state ruled companies has taken the right and destroyed the self-initiative and self-esteem of many village communities to govern and organise themselves in a sustainable manner. (Hiremath 2008) When independence was achieved in 1947, maybe one third of the villages had panchayats, which were mostly far from being flourishing institutions (Menon 2007).
Many activists of the Indian independence movement, mainly Mahatma Gandhi, today referred to as the “Father of the Nation”, stressed the importance of “how” independence would be achieved, instead of the mere accomplishment of driving the British out. It was his great concern that it would not help the country if the British government would simply be replaced by an Indian government, adopting the colonial constitution and consequently also the system. In the *Hind Swaraj* (Indian self-rule) (1938), first published in 1909 in the *Gujarat Columns of Indian Opinion*, Gandhi points out that “[i]f India copies England, it is my firm conviction that we will be ruined” (p. 28). He was frequently mentioning that the English have not taken India, but the Indians gave it to them, admiring the great British nation and their businessmen and being keen on adopting their ways and custom. Many renowned Indian writers, politicians and economists shared this idea and further accused this imitation of Western systems of thinking and governing for being the reason for the misery among the people and the degradation of the natural environment. Sri Aurobindo, a famous Indian politician, activist during the independence movement and philosopher, wrote as early as 1909 in an essay published in the first issue of the weekly review *Karmayogin*: “The nineteenth century in India aspired a political emancipation, social renovation, religious vision and rebirth, but it failed because it adopted Western motives and methods, ignored the spirit, history and destiny of our race and thought that by taking over European organisation and equipment we should reproduce in ourselves European prosperity, energy and progress.”

India is a country where more than 70 percent of the population live in villages, often consisting of less than 1,000 habitants (GOI 2001). Gandhi used to repeatedly clarify that the country could only prosper when the villages prosper. In order for more than 600,000 villages (GOI 2001) to be revitalised, he pointed out that each village needed to be enabled to govern itself locally. Villages should become self-sufficient at least to the degree that they could themselves come up with the most basic provisions as food, water and cloth: “My idea of village swaraj is that it is a complete republic, independent of its neighbours for its own vital wants, and yet interdependent for many others in which dependence is a necessity. Thus every village’s first concern will be to grow its own food crops and cotton for its cloth. [...] It will have its own waterworks, ensuring clean water supply. This can be done through controlled wells or tanks. [...] As far as possible every activity will be conducted on the cooperative basis. [...]”. (Gandhi 1942) Gandhi envisioned an India consisting of confederations of self-governing, self-reliant village communities, or village republics. The community would represent an extension to the family, rather than just consist of a set of competing individuals. Villagers deriving their livelihood from products of their own homestead,
using in the village first what is produced in the village, would decrease their vulnerability and
dependence on the external markets. Gandhi believed in turning around the British approach of
centralised, industrialised markets, away from a commercial mass production, to a local, human
based production by the masses. (Kumar 1997)

Gandhi's vision of independent India, of which himself often declared that India was not yet ready
for, was not merely aiming at achieving a decentralised system of governance (Gandhi 1938). It
envisioned a strong human development and the restoration of human dignity. Satish Kumar (1997)
describes the present human alienation in his article Gandhi's Swadeshi – The Economics of
Permanence as followed: “Mass production leads people to leave their villages, their land, their
crafts, and their homesteads and go to work in the factories. Instead of dignified human beings and
members of a self-respecting village community, people become cogs in the machine, standing at
the conveyor belt, living in shanty towns, and depending of the mercy of the bosses.” It was
Gandhi’s firm conviction that modern development, driven by the cult of individuality, would lead
away from self-fulfilment and communal unity. Mass production does not respect the producers nor
is it concerned with a dignified process of production. It places all the importance on the product,
while only an equal consideration of producer, process and product will lead to a healthy,
humanised way of production. (Kumar 1997)

3.6. 73rd amendment of the Constitution

The Constitution of India, passed by the Constituent Assembly on 26 November 1949, declares in
its Article 40: “The state shall take necessary actions to organize village Panchayats and to endow
them with such powers and authority as may be necessary to enable them to function as units of
self-government.” (GOI 1949) Although this shows that the will to establish the Panchayati Raj
System was present from the very beginning after independence, it was only by the end of the
1950s, that some Indian States passed regulations to determine rural development activities of gram
panchayats. The process however stagnated in the following decades and it was only in 1992 that
an Act of Parliament aiming at the consequent devolution of power to the lowest level of
governance was accepted, in form of the 73rd amendment. (Rürup 1999)

The 73rd amendment of the Constitution was presented in the lok sabha (Parliament of India) under
Prime Minister Rajiv Gandhi. It formulates the necessity to empower the gram sabha (village
assembly) and promote people's participation at the village level as it aims at laying the cornerstone
for communal self-governance how it was described and envisioned by Mahatma Gandhi. The Constitution passed in 1994 says, in its Article 243 (B), that *panchayats* have to be established in every State, at the village, middle and district level and that the *gram sabha* can exercise the right and duties which have been passed by the *vidhan sabha* (legislative assembly). (Hazare 2003) Despite the Panchayati Raj System being called a three-staged system of governance, the *gram sabha*, assembling all village members, actually represents a fourth stage, playing an important democratic role as a control and acclamation body. The *gram sabha* is mentioned in the Constitution but not defined, which leaves specifications open to the *vidhan sabha*. (Rürup 1999) Article 243 (G) of the Constitution (GOI 1992 b) implies that the *vidhan sabha* should formulate laws to devolve powers and rights to local *panchayats*, which then can carry out work independently and execute

“(a) the preparation of plans for economic development and social justice;
(b) the implementation of schemes for economic development and social justice as may be entrusted to them including those in relation to the matters listed in the Eleventh Schedule.”

Independent finance committees shall enable the working out of a fiscal system of taxes, toll or dues that would allow the panchayats to mobilise their own financial resources. (Rürup 1999)

In spite of the formal effort to devolve the power to the local level, “people have not exercised their rights either due to ignorance or due to deliberately being kept in the dark” (Hazare 2003, p 43). In many cases, financial support is only given for the carrying out of governmental schemes that do not leave much room for specifications, so that a true decentralisation or democratic process of decision is not yet achieved. In order to play a decisive role in the local administration and design process, panchayats will have to be accepted as integral institutions of the federal Indian government, instead of being denounced as local development agencies. However, the Indian government has demonstrated the will and initiated the process of decentralisation by introducing legislations to empower local communities. For the implementation of this political will, cooperation and coordination of NGOs and institutions of civil society at the village level will be needed. (Rürup 1999)

3.7. Participatory natural resource management and socio-environmental movements

Even though acts and legislations on environment and decentralisation may not have brought immediate effects in the planning and implementation process, they have successfully spread awareness among the population and mobilised grass root organisations to claim the rights of neglected communities. There are numerous examples of such movements, conducted either by or with affected marginalised groups in rural India that have attracted a considerable amount of international attention. (Dembowski 2001) Examples are the Chipko movement, which aimed at the protection of natural forests and was awarded with the Right Livelihood Award in 1987 “for its dedication to the conservation, restoration and ecologically-sound use of India's natural resources” (RLAF 1987), and the Save Narmada movement, which emerged during the planning of the Narmada Dam Project in the late 1980s in Gujarat, mobilising activists, tribal people and farmers in non-violent oppositions to large-scale development projects that come at the detriment of local communities.

Regarding activities or movements in India that aim to protect the natural resources, one has to understand that the main objective has always been the protection of the poor, their livelihoods as well as their rights. While western NGOs are often concerned about the conservation of natural resources for nature's sake only (e.g. WWF – Worldwide Nature Fund), Indian NGOs are concerned
about the protection of natural resources primarily for the people's sake. Dembowski (2001) notes that “ecological reasoning has become a resource in the socio-economic struggle to protect livelihoods” (p. 71). Consequently, the emerging movements are people movements: people are educated and empowered to claim their rights. In this process, NGOs function as mediator between the communities and the higher bodies of governance and mostly see their duty in filling the gap in those areas where the government fails, for instance in delivering education, health facilities, social justice and the protection or development of resources. (Gan 1998)

One of these community-based movements evolved with the revolutionary concept of water councils, the Pani Panchayats, which is explained here in more detail, as its development is relevant for the understanding of the development works and the social organisation in the village of Ralegan Siddhi. The Pani Panchayat concept was developed by Vilasrao Salunkhe in the early 1980s and presented a radical new approach of not only regenerating degraded watersheds by simple water harvesting techniques, but also of enabling the equitable distribution of the water resources within the community. (GGP 2007)

After witnessing the severe drought in 1972 in Maharashtra, which made agricultural production impossible and left hundreds of villages without food or water, Vilasrao Salunkhe found that their problem could be resolved if efforts were made to preserve the scanty rainfall that the region was receiving every year. Only if the poor farmers had water to cultivate their lands, they could employ themselves to get a decent income and rise out of poverty. Salunkhe decided to put up a watershed management system on a 16-hectare plot in the dry Naigaon village in Pune district, Maharashtra, that had remained uncultivated for several years and, thus, was given to him to try his experiments. When he started to cultivate the land he managed to produce not more than 2 to 4 bags of grains a year. After starting restoration works in order to properly conserve the soil and to harvest the little yearly rainfall, by digging contour bunds, building a percolation tank and digging a well from where water was pumped up to the watershed, he planted about 4,000 trees, of which 2,000 were fruit trees, amid the rocky areas along the bunds. five years later, Vilasrao Salunkhe had a production of 100 quintals (1 quintal = 100 kg) of grains a year and employed five families with a stock of 15 cattle to work on his 16 hectares of land. He had proven with this experiment that even in an unproductive, dry area, half an acre of land was sufficient to provide one individual's food requirements for a full year. (Alvares 2001; Rai 2001)

Vilasrao Salunkhe was one of the first Indians to think of environmental regeneration in terms of
watersheds. After his technical success in Naigoan, it was his ambition to multiply it in neighbouring areas. As he could see that most development projects in India suffer, even today, from the lack of equity regarding the distribution of benefits, it was his primal goal to develop a concept that would follow the precept that water, as a common resource, should be equally accessible to all. For this purpose, landless villagers would acquire membership of the installed lift irrigation schemes, so that water and land rights could be decoupled, meaning that the amount of water available would be attached to the family size and not the size of the land holding. This would further solve the employment problem, as landless farmers would cultivate the excess land of larger landholders. To organise a sustainable water management system, villagers would need to collectively control the lift irrigation schemes, the implementation and maintenance of water harvesting practices, as well as the water use and the cropping patterns within the village. To realise this need, Salunkhe suggested the creation of water councils, the *Pani Panchayats*, which would be represented by elected villagers and would organise two meetings a month to discuss the means and goals of the watershed projects, the villagers' concerns, problems and ideas. Today, many of the principles of the *Pani Panchayat* model are integrated in the policy directives of the States of Maharashtra, Andhra Pradesh and Madhya Pradesh. (Alvares 2001)

The enforcement of *Pani Panchayats* made villagers understand that collective action and an equitable system of resource management will benefit all. They are empowered to organise and help themselves, instead of expecting outsiders to come up with new schemes that could improve their situation. All of these examples of socio-environmental movements conducted on the basis of collective action take their success out of the solidarity that is established within and between the concerned communities. If tribal people, often ignorant because uneducated, obtain knowledge of their rights, they naturally become empowered in exercising and enforcing them.

3.8. The practice of watershed management in India

Under the name of watershed or micro-watershed management, many projects were initiated in order to combat water scarcity in the drylands of India, mainly in the State of Maharashtra. A watershed can be defined as an area from which all water drains to a common point. So every stream has its own watershed, as topography is its key element. Watershed management is a sort of planning of man-made micro-watersheds through a social, economic and operational approach, using the natural topographic conditions for an effective use of the resources. The FAO defines micro-watershed as “a small first or second class watershed, in which a certain number of families
live (Community) making use and managing the resources of the area, mainly the soil, water, vegetation, including crops and native vegetation, and fauna, including domestic and wild animals. From the operational point of view, the micro watershed is an area that may be planned by a technician counting on local resources and/or a number of families that may be treated as a social nucleus that shares some common interests (water, roads, organization, etc.)” (Van Wambeke 2009). This implies, that the management of watersheds is considered as an interaction between economic, social and environmental aspects. (Van Wambeke 2009)

In this regard, the efficient management of resources through an organised watershed management is considered to be able to increase people's earning capacities, to build sustainable rural livelihoods and to protect the population from droughts. It is based on the concepts of resource conservation, generation and utilisation to increase the availability of water, food, fodder, fibre and fuel. Through the development of natural resources, the social resources are expected to be enhanced and the communities empowered by enabling them to govern themselves. Consequently, a successful, sustainable watershed management must be economically, environmentally and socially acceptable and applicable by the villagers themselves. The different resources are considered as an entity, recognising their interdependence. (Yogesh 2009)

In the watershed development projects, there are mostly two main parties involved: the first one is the implementing institution and the second one is the community itself. The implementing institution should play the role of an organiser and trainer for the community, considering the area's administrative and property boundaries in the planning and organisation process. Particular land use will have to be based on the land capability, entailing that projects will affect different members of the community unequally. The active institution has to be acquainted with the needs of the different social groups within the village to organise the community to work collectively and finally bring the expertise to make everyone benefit according to his proper needs and possibilities. The successful implementation of a micro-watershed implies the pursuit of social processes that go beyond the simple technical instruction. (Kerr et al. 2000)

John Kerr et al. (2000) wrote that “watershed projects cannot succeed without full participation of project beneficiaries and careful attention to social organisation” (p. 3). His evaluation of dryland watershed projects in India has shown that more participatory approaches have concluded with better results than technical, top-down programs. He distinguishes between government projects, projects of NGOs and government-NGO collaborative projects. On the one hand, government
projects have been mostly using the top-down approach, implementing techniques without considering inputs from villagers. Local committees would mobilise labourers and facilitate the management of common lands. On the other hand, NGOs would put much more emphasis on social organisation, starting organisational work long before the technical work begins. This however will raise their administrative costs to be much higher than those of the government projects. NGOs often combine micro-watershed with other development activities in a village. The best project results were achieved in the government-NGO collaborations, combining the government’s technical expertise with the NGOs social organisation. (Kerr et al. 2000)

Ralegan Siddhi is in this context a village where the process of micro-watershed development was initiated by the villagers themselves. As work progressed, the villagers did however not refuse the government's financial help. Throughout the process, and even today, they make sure, that they keep the ownership by own financial contributions and control the procedures of the projects.

3.9. The State of Maharashtra

The State of Maharashtra is located in the south-west of India. Its capital is Bombay. The geographical area of the state is 30.8 million ha, with a cultivable area of about 22.5 million ha. As per 2001 census, the population of Maharashtra has reached the mark of 100 million. (Sodal 2004)

The climate is tropical, with an annual rainfall varying from 400 mm to 6000 mm. The average rainfall is around 1,300 mm, of which more than 80 percent fall during the monsoon season, from June to September, and the remaining between October and December. The monsoon therefore has a crucial impact on the management of the State's water resources. (Sodal 2004) A narrow coastal plain separates the Arabian Sea from the Western Ghat Mountains. On the eastern side of the mountains lies the Deccan Plateau. In the coastal mountains rainfall is very high, while the western part of the Deccan Plateau, in the rain shadow of the Ghats, is very dry. (Kerr et al. 2000)

The State's economy depends on agricultural production. Therefore, the promotion of irrigated agriculture has played a great role in the rural development policies of Maharashtra. (Sodal 2004) In the dry zones of the State, the conditions for rainfed agriculture are difficult, while further east, where annual rainfall rises to more than 1,000 mm, they are more favourable. As water is a scarce resource in most parts of the State, its harvesting and conservation has been a major challenge and a high priority. (Kerr et al. 2000)
3.10. Rural development and watershed management policies in the State of Maharashtra

With the 1942 Bombay Land Improvement Schemes Act, the government of Maharashtra was the first State to sponsor watershed development projects in India. As today, the focus of these projects was on soil and water conservation, new methods for rainfed farming and control over grazing. It was only after the severe drought of 1972 that watershed development became the focus of rural development policies in Maharashtra, aiming to “drought-proof” the land through the construction of water harvesting structures that would provide drinking and irrigation water throughout the year. (Kerr et al. 2000)

In 1982, the Comprehensive Watershed Development Program (COWDEP) was initiated. It should combine the earlier released Employment Guarantee Scheme, which aimed at providing work to anyone who needed it, with the technical provisions of the 1942 Bombay Land Improvement Schemes Act. However, through coordination difficulties between the cooperating government departments, the COWDEP could not provide the envisioned results. (Kerr et al. 2000)

The Drought-Prone Areas Program (DPAP), funded by the central government's Ministry of Rural Development, was initiated in 1971-72. It initially covered a wide range of activities, such as water and soil conservation, afforestation, the development of irrigation and infrastructure. Over the years however, it has increasingly laid emphasis on the prevention of drought, so that by 1980 the program had become an exclusive watershed development program. The focus was laid on soil conservation, water harvesting, pasture development and afforestation. Just as other government-funded watershed programs, the DPAP did not integrate villagers into the process and remained mainly a technical program. (Kerr et al. 2000)

Based on the experiences of COWDEP and other projects, the Jal Sandharan Program was launched in 1992. The Jal Sandharan soon became a department in itself, representing an effort to treat villages as a unit of planning and implementation, aiming at raising the groundwater table to provide drinking water and irrigation for at least one crop a year. The program is implemented by a district-level committee represented by members of all the government agencies involved in the project. The village sarpanch (elected leader, mayor) has to approve the project's implementation after discussing it in a meeting with the villagers. Even though the Jal Sandharan is based on decades of experiences, it also shows the difficulty of transferring coordination in the upper bureaucratic level into coordination at the village level. (Kerr et al. 2000)
In the meantime, NGOs had adopted a participatory, community-based approach towards the development of watersheds, integrating local people into their planning and implementation plans. In 1994, based on the well known Hanumantha Rao Committee Report (GOI 1994), the Ministry of Rural Development adopted this approach and devolved most of the responsibilities into the hands of the villagers and project-implementing agencies at the village level. These could either be governmental, non-governmental or corporate sector agencies. However, the process of reorientation was a slow one, especially in the State of Maharashtra, where practically no work had been carried out until 1997. (Kerr et al. 2000)

4. Methodological context

The framework for the analysis and evaluation of Ralegan Siddhi's natural resource and socio-economic development is build upon Elinor Ostrom's, 2009 Nobel Price Laureate of Economics, groundbreaking researches on the public management of common-pool resources. To understand her approach to current theories that shape today's natural resource management and development activities and to become more familiar with her findings, this chapter explains the most important points of Ostrom's framework for institutional analysis.

4.1. The “tragedy of the commons” and its consequences

Elinor Ostrom has been studying various communities governing common-pool resources in order to find out “how to best limit the use of natural resources so as to ensure their long-term economic viability” (Ostrom 1990, p. 1). She has been challenging mainstream models, such as the “tragedy of the commons”, that exist on collective action, arguing that their metaphorical use in policy making will result in the creation of fixed theories and assumptions ignoring the large cultural and biophysical diversity underlying the different action situations.

In 1968, an article, published by Garrett Hardin in Science, stated that environmental degradation is the logic consequence whenever a scarce resource is commonly used by multiple individuals. Calling this the “tragedy of the commons”, he gives the example of a pasture, openly accessible to many herders. The herders obtain direct benefits from their own animals, consequently they are motivated to add more, and will as a result become victim of delayed and shared costs from the deterioration of the commons whenever their cattle overgraze. Hardin concludes: “Ruin is the
destination towards all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons.” (Ostrom 1990, Hardin 1968, p. 1,244) The “tragedy of the commons” became a generally accepted model, used by scholars to describe all kinds of problems, such as firewood crisis throughout developing countries (Norman 1984), acid rain (Wilson 1985) and many more. The idea that rational human beings can achieve rational results is challenged by this concept, often also referred to as the “prisoner's dilemma game”, as it portrays how individually rational strategies lead to collectively irrational outcomes. (Ostrom 1990)

Another model, “The Logic of Collective Action”, was developed in 1965 by Mancur Olson and displays the difficulty of getting many individuals to work for common benefits, when they can increase their own. He argues that “unless the number of individuals is quite small, or unless there is coercion or some other spacial device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interest” (Olson 1965, p. 2).

All of these theories are based upon the “free-rider problem”, meaning that a person that cannot be excluded from using a common good will most certainly not voluntarily contribute to its provision. (Ostrom 1990) Based on these models, scholars are used to justify two different strategies, or policy recommendations, to avoid the “tragedy of the commons”:

- The first one suggests that central authorities, such as the government, must control the natural resources and impose rules on communities, restricting individuals' actions and thereby preventing the destruction of natural resources. The idea of centralising the regulation of common lands, forests or fisheries has been followed extensively, especially in developing countries, as was pointed out in chapter 2.4. A central governing authority will have to simultaneously experiment with all the common-pool resources in the framework of their own legislative restrictions, most probably hampering necessary social and operational changes to prevent problems that may be obvious only to the community itself. (Ostrom 1990)

- The second recommendation suggests the creation of private property rights. Elinor Ostrom (1990) however argues that dividing a meadow into two will only lead to the end that “each herder will be playing a game against nature in a smaller terrain, rather than a game against another player in a larger terrain” (p. 12). Different investments as the putting up of fences
and problems concerning distribution and the availability of fodder will moreover result in inequalities and in an overall less efficient market set-up as if herders organise themselves to jointly use a larger grazing area. Ownership rights will make individuals act independently, therefore hamper interrelationships that would contribute to a more effective conflict resolution system and information exchange. Furthermore, the establishment of private rights to water and fisheries is much more complex as the division of land areas into separate parcels. (Ostrom 1990)

Both strategies are imposing an external institutional change on the affected individuals in order to solve the commons' dilemma: in any suggested solution, a central authority is called upon, either making unitary decisions, or parcelling out ownership rights. Further, they are based on models of idealised States or markets ignoring the difficulty of providing optimal accuracy of information, monitoring capabilities and sanctioning reliability (Ostrom 1990). David Korten (1980) called the proposal of uniform solutions to a wide variety of problems the “blueprint approach”. Whenever a design is able to successfully address the needs of a society, policy makers tend to consider it as “the” solution that will fit many other situations. Very often however, this approach of facilitating and skipping many planning processes turns out to be the main hindrance in finding an appropriate solution.

4.2. Elinor Ostrom's approach to governing the commons

To address the problems, resulting from misleading theories, Elinor Ostrom (1990) suggests in her classic *Governing the Commons* that instead of simply viewing individuals as prisoners incapable of escaping the commons' dilemma and, as a result, imposing a single solution to different problem situations, there may be many solutions to be used in a complementing way, varying from situation to situation. It is not a simple prescription that will be able to organise a complex system of common resources, but it would rather be a time-consuming and costly process that is needed to acquire information about local variables and to formulate culturally acceptable rules. So, instead of accepting the “tragedy of the commons” as a fact, the question to be asked is how some communities manage to solve the problem of the commons while others do not and how their capabilities can be enhanced to do so. At a most general level, it is a question of organisation, which is formulated as “how to change a situation from one in which appropriators act independently to one in which they adopt coordinated strategies to obtain higher joint benefits or reduce their joint harm” (Ostrom 1990, p. 39).
Central to Elinor Ostrom's understanding of organising larger groups of individuals using the same resource is the concept of *polycentric systems*. It is based on the idea of a downward directed accountability, shifting administrative as well as production power from a small number of individuals over to the communities. These communities will have to be organised, or find means to organise themselves in order to build and strengthen institutions and organisations on differing scales, boosting the flow of information and creating a high number of units with a considerable amount of authority. The organisations shall be able to make and enforce rules in their particular domain of activity. While the highly acclaimed decentralisation mostly remains characterised by a hierarchical organisation of decision-making, with national governments remaining the centre of authority, polycentric systems promote an allocation of responsibilities and as a result enhance mutual monitoring within a community. (Ostrom 1993) This in turn, properly performed, will strengthen confidence, self-determination and trust within a mobilised group of individuals who take on their own matters of concern.

Ostrom (2005) notes that community-based or participatory development, increasingly practised by NGOs in developing countries and promoted by governments, is mostly aiming at the organisation of a great number of groups at the same level. If, after implementation is completed, the NGO that provided staff assistance and external resources is about to leave, these organisations are in many cases not able to cope with major comprehensive conflicts. Complex polycentric systems organised on differing levels of governance can more easily adapt to external changes while the risk of total failure for an entire region is drastically reduced. Failing small systems can call upon larger systems and vice versa. The organisations operating in these systems are a mixture of voluntary agencies, NGOs, private associations, governmental departments and cooperatives, compromising overlapping units, so that information about local conditions, policy experiments and activities can easily be exchanged. In such a situation, major conflicts between the multiple interdependent units may arise. These conflicts may, on the one hand, lead to coordination problems and negative processes, on the other hand, however, generate more information enabling participants to solve challenging problems and further the community's development. (Ostrom 2005)

Autonomous communities organising themselves in order to sustainably manage their natural resources have the advantage that they can more effectively learn from experimentation than a central authority. They have the local knowledge about the biophysical system that they are living in and know the culture and norms of behaviour common to their region. Creating their own rules,
they can build up trustworthy relationships based on reciprocity and notably decrease the monitoring costs through mutual understanding and monitoring. The users of the common resource themselves know best what changes occur in their environment and when they have to adopt their rules. (Ostrom 2005)

4.3. Analysis and evaluation

Due to the diversity and complexity of factors that underlay institutions and organisational systems within communities, the question of optimal design will probably remain unanswered by scientists, economists and policy theorists. However, there is a huge number of robust and sustainable situations to be found within different communities all around the globe. These communities differ largely regarding their rules or institutional settings, biophysical laws and their community attributes. (Ostrom 2005) The focal point of Elinor Ostrom's empirical studies is the detection of the similarities of underlying factors that characterise robust socio-ecological systems. For this purpose, she has analysed successful long-enduring and self-governing common-pool resources and named eight design principles (which will be named and defined in chapter 4.3.3.) that were, most probably unconsciously, followed in all of the cases. She, as well as many other scholars, have further tested and agreed with those principles in applying them to analyse other successful situations as well as institutional failures.

4.3.1. Exogenous variables affecting an action situation

Policies increasingly accept that the consideration of the high diversity of action arenas, the socio-cultural dynamics and the economic and environmental variables, all play a defining role in the success of development programmes and natural resource management systems. As its analyse is a time-consuming and costly process, these factors mostly remain ignored. (Mehta and Satpathy 2008) It is therefore important for an analyst or a policy maker to first understand how rules, biophysical and material conditions and the attributes of the community affect a given situation before considering and planning implementation suggestions. (Ostrom 1990) Following is a deeper look at the main factors:

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1Elinor Ostrom uses the term robustness to describe sustainable natural resource management systems. She refers to Carlson and Doyle's (2002, p. 2538) definition: “the maintenance of some desired system characteristics despite fluctuations in the behaviour of its component parts or its environment”. (Ostrom 2005, p.258)
• *Rules* are, in the sense of regulations, a “set of instructions that create an action situation in a particular environment” (Ostrom 2005, p 17). They build the structure of a given situation and explain the system of property rights in use. Consequently, in order to understand or undertake changes and to improve outcomes of projects, rules, on the community level as well as on a larger scales, are necessary to be analysed. Ostrom (2005) stresses on the definition of rules as “shared understandings by participants about enforced prescriptions concerning what actions (or outcomes) are required, prohibited or permitted” (Ostrom 2005, p.18). Rules can also be used in the sense of cultural prescriptions or norms. (Ostrom 2005) If rules are voluntarily followed by a set of individuals, they do not necessarily have to be enforced, but are accepted as appropriate and become part of the local culture.

• The *biophysical and material conditions* are important to be analysed as they affect the choice of rules, the possible actions and the outcomes of their implementation. One set of rules may lead to entirely different actions, and the same action may lead to different outcomes depending on the world that is acted upon. The biophysical and material conditions determine the relevance of conflict-bearing attributes such as excludability and subtractability. The difficulty of excluding potential beneficiaries from the provision of a good or a service can lead to the “free-rider problem” (see chapter 4.1.), which again can lead to the depletion of the resource or lack of its maintenance. Subtractability describes the individual's possibility to subtract from a resource. If, for instance due to biophysical or material conditions, one beneficiary is able to grab considerably more of the subtractive service than others, which might lead to non-economic uses, effective rules are required to enable the productive allocation of the resource. Other important attributes may be the size of the resource, the mobility of its units, the presence of storage capacity, rainfall, soil and slope information and many other factors. (Ostrom 2005)

• The *attributes of a community* describe the common understanding of particular institutional and operational structures, the size and composition of, as well as the inequalities within a community. The *culture* or the mental models will determine social values and behaviour and therefore affect the implementation of Elinor Ostrom's design principles (see chapter 4.3. and 4.3.3.). In some situations, mental models may not accept institutional changes, as particular individuals may be deeply rooted in traditional rules and norms that hamper their development and render the translation of individual preferences into collective choices.
impossible. (Ostrom 2005)

Only after acquiring the needed information about the society and the action situation in which it is operating, it is possible to analyse the robustness of a system and its institutions or to predict an institutional change.

4.3.2. The problem of institutional change

Before a set of individuals can organise a situation in such a way that they jointly and sustainably manage a common resource, they have to be able to collectively procure institutional changes. The question of providing institutional change faces three major problems that need to be solved: the problem of supplying new institutions, the problem of credible commitment and the problem of mutual monitoring. (Ostrom 1990)

- The first problem to be addressed is the one of supplying new institutions. Robert Bates raised the issue of supply, which has not lost relevance, in 1988, pointing out that “the new institutionalism is contractarian in spirit. Institutions are demanded because they enhance the welfare of rational actors. The problem is: Why are they supplied?” (Bates 1988, p.394) Even if institutions are supplied to provide a public good, the problem of sharing the good equitably will not be solved. Consequently, the question to be addressed is: How can a group of individuals supply institutions that solve the problem of collective action?

- The second point is the problem of credible commitment. Once the problem of supply is solved, the question arises whether all individuals will be committed in following and enforcing the newly designed institutions. To understand this problem, one has to consider the temptations and possible choices available to users of a common resource to break the rules and free-ride on behalf of others. A self-organised community must find a way to solve this problem of commitment without an external enforcer.

- The third problem, the problem of mutual monitoring, is closely linked to the second. Elinor Ostrom (1990, p.45) argues that “[w]ithout monitoring, there can be no credible commitment; without credible commitment, there is no reason to propose new rules”. Consequently, a self-organised group of individuals must develop strategies where they
themselves get engaged in monitoring others, making information about the rate of rule conformance available to all, so that members will adopt a consistent rule-following behaviour. As a result, monitoring cost will be kept low and sanctions will not have to be severe.

Once solutions to these problems are provided, a community is able to adopt and enforce a new set of institutions, possibly leading to a sustainable and equitable use of their natural resources.

4.3.3. Design principles that characterise robust socio-ecological systems

Instead of proposing a strict theory on how to build up a robust system for the management of common natural resources, Elinor Ostrom (1990, 2005) named eight design principles that were followed in all the robust self-governing situations that were analysed. On the following pages, these design principles will be listed and shortly explained.

1. Clearly defined boundaries: The boundaries of the resource system as well as the individuals and households that have the rights of withdrawing resource units are clearly defined, known and accepted by the possible users. This addresses the “problem of free-riding” and is opposing to systems with “open-access” institutions. If users are able to establish membership rules, possibly organised in societies or cooperatives and self-determined by the community, they can develop a situation of trust and reciprocity. They must understand that they have mutual responsibilities and benefits, using the resource according to the rules and defending it from outsiders.

2. Congruence between benefits and costs: A fair system to account for the perseverance of the resource is developed. It controls how many, when and how resource units are harvested. This system must fit with local conditions and the soundness of the resource and should consider fair rules of distribution related to labour, materials and/or money inputs.

3. Collective-choice arrangements: Most individuals who are affected by operational rules participate in their modification. This will allow the users to design and modify their rules according to local circumstances and will give the community a sense of ownership. Knox and Meinzen-Dick (2001, p. 22) note that property rights “are significantly more likely to address the interests and needs of local people when they are not imposed from the outside
but rather are based on existing rights and reflect local values and norms.” Sekher (2000, p. 8) found while conducting village studies in Orissa, India, that the “wider the representation of the community in the organisation, the better are its chances of securing local cooperation and rule confirmation for managing and preserving the resource.” Locals will further be able to integrate their local knowledge about resources, management and implementation techniques and will themselves be accountable to the users (Shukla 2002).

4. *Monitoring:* The monitors actively auditing the condition of the resources as well as the behaviour of the users are accountable and/or are the users themselves. If rules are not monitored or enforced, the probability that some will free-ride and contribute to the destruction of the resource rises. In most self-governing socio-ecological systems community members comply knowing that the collective objective and the benefits are achieved and that others are also complying. Mutual monitoring often becomes a by-product when a group of individuals is depending on the same resource.

5. *Graduated sanctions:* Users who violate the rules will receive graduated sanctions according to the seriousness of the violation. In most robust self-organised systems, a first sanction for rule-breaking is very low. A threat to the system occurs only if some users keep breaking rules repeatedly. In such a situation, the sanction might be severe in order to prevent others from following. In mutual monitoring systems the sanctioning can easily be adjusted and appropriated as the community members most probably are well informed about compliance and sanctioning behaviour.

6. *Conflict-resolution mechanisms:* Members of the community have rapid access to low-cost local arenas, where conflicts between any community members can be resolved. Users may interpret rules differently and, as a result, perform actions differently. If these conflicts are not addressed within the community, they may reduce trust between its members. There are many examples of well-developed, often informal, local mechanisms for conflict-resolution. In some situations it might be a complex court setting, in an other situation it might simply be the selected leaders acting as resolvers of conflicts.

7. *Minimal recognition of rights:* The community's rights to devise its own institutions are not challenged by external authorities. In some situations, central governments may dictate rules upon communities so that they have little chance to formally or informally organise
themselves.

8. **Nested enterprises:** When considering resources that are part of larger systems, operational and governance activities as well as institutions are organised in multiple layers of nested enterprises. In these systems small-scale organisations are nested in larger organisations to constitute complex polycentric systems as described earlier in chapter 4.2.

Also in a watershed, it is of major importance for groups with shared interests to interact. Their actions must comply with each other rather than competing against each other. For this purpose, organisations or societies will have to organise and monitor the groups. These organisations form the medium level, between the lower and smaller user-groups and higher level of village administration. If this system, organised on three levels of governance, is functioning well, the only duty that the district, State or national government has is to procure monetary or technical assistance if needed and demanded by the village council.

4.3.4. Evaluating the outcomes and sustainability of institutional arrangements

There is a large number of potential evaluation criteria to determine the sustainability of institutional arrangements. Elinor Ostrom (1993, 2005) focuses on five, which are shortly explained:

- The **economic efficiency** of a situation describes the relation between benefits and costs that are allocated through alternative institutional arrangements. It will determine how a change in rules has affected the behaviour of members and how it has effected the management of the resources.

- **Equity**, as a second evaluation criteria, can be divided into fiscal equity and redistributional equity. Fiscal equity suggests the allocation of benefits to the bearer of costs. If this is not guaranteed, the commitment of maintaining the facility or soundness of the resource will most probably be negatively affected. Redistributional equity is necessary to make all members, including the poor, benefit from a facility or development.
• **Adaptability** is an important feature of a community, describing their timely response to external changes within an environment. Is the community able to adopt new institutions in the case of alternating external circumstances? The term **robustness**, often used along with adaptability, describes the ability of a system to maintain its “performance even when it is subject to external, unpredictable disturbances” (Ostrom 2005, p. 67).

• If **accountability** is missing in a collective-choice situation, members of the system are able to engage in all kinds of opportunistic behaviour. Consequently, it is important that information regarding the management of a resource are accessible to users and that officials are accountable concerning the policies and rules.

• The **conformance to general morality** will determine whether opportunistic behaviour and cheating will lead to significant benefits for the cheater. In this regard, the question whether there is a fair interaction between interest sharing individuals and whether those who righteously follow the institutional arrangements will be rewarded in the process has to be considered.

It is important to lay emphasis on some of the criteria, considering their interrelationship and comparing their significance in the analysed situation. Without redistributioal equity, for instance, the economic efficiency criteria is of little use regarding the sustainability of a situation.

### 4.3.5. Threats to sustainable governance systems

Governance systems characterised by the eight design principles and conform with different factors affecting sustainability have a much higher chance of overcoming difficulties and sudden changes. However, even those institutions can fail. The following threats may, according to different theoretical conjectures and empirical findings, lead to failure of long-term sustainable governance systems (Ostrom 2005):

• **Rapid exogenous changes** in technology, human, animal or plant population, in the national governance system or the heterogeneity of the community may destruct self-organised communities and curtail their activities.
• *Failure in the transmission*, from one generation to another, of the main principles on which the community is build.

• Sudden program organisation based on the “blueprint approach” (see chapter 4.1.) as well as the high access and acceptance to external funds can change a complex, self-organised and interacting action situation into an externally driven experiment, characterised by uncertainty and dependence.

• *Corruption and other opportunistic behaviour* can quickly become threat when supervision and monitoring of activities as well as the access to information is not adequately guaranteed.

• The lack of large-scale supportive institutions “may be just as much a threat to long-term sustenance as the presence of preemptive large-scale governmental agencies” (Ostrom 2005, p. 278). Large-scale institutions may provide local communities with, for instance, high quality scientific information about physical settings, hydrological and geological structures that the communities themselves will need in the course of their development.

4.4. Methodology followed during the field work study

The village of Ralegan Siddhi serves as an example by itself. The techniques used for conservation work can be seen on every agricultural field, every slope and in every drainage line. The effects on the natural landscape are obvious; Ralegan Siddhi stands out as a green oasis surrounded by bare dry lands. Even though the natural resource development was implemented with a fair share (nearly 50 percent) of governmental funding, the activities were self-organised and implemented by the villagers themselves. The natural resource management system that is in place today is run and organised by the different community organisations whose members are habitants of Ralegan Siddhi. In this context it is interesting to apply Elinor Ostrom's approach and design principles on the case of a contemporary development model like Ralegan Siddhi.

In a first instance however, the natural landscape, the social conditions and the factors leading to Ralegan Siddhi's institutional change have to be considered and elaborated, which will be done in chapter 5.1. Chapter 5.2. will then analyse the problems of supply, commitment and monitoring and
the accordance of the village's institutional design with Elinor Ostrom's eight design principles. The outcomes of the village's development will be evaluated and some of the community features and characteristics highlighted and possible threats to the village's sustainability will be named, all before chapter 5.3. sets Ralegan Siddhi in a wider context which will name some of the recent efforts to replicate its success story.

As stakeholders and villagers from different backgrounds and involved in different activities were questioned and provided information, there cannot be a fixed questionnaire that fits for all. Many discussions arose with villagers who were able to communicate a feeling for the community spirit that is present amongst them rather than explain the concrete structures that underlie their institutional and social activities.

The study conducted in the village as well as the interviews and interactions with the people were aiming at providing answers to the following questions:

- **What organisational structures exist at what level of governance?**

To determine how the community organises and handles administrative and institutional matters it is important to find out what kind of societies, organisations, cooperatives exist and on what level they operate.

- **How are the different actors organised and how do they interact?**

In a natural resource management system of the scale of Ralegan Siddhi, the different organisations have to interact, their actions have to be coordinated and for this purpose a flow of information has to be intact. To evaluate their actions and interactions, their internal structures have to be understood and the stakeholders have to be known.

- **What influence do the identified actors have on socio-economic factors?**

The organisations consisting of community members will have a direct influence on the individual within the community as well as on the community itself. Does the social organisation install some kind of community feeling, does it change social behaviour and improve the well-being of the
villagers? Does the institutional change lead to new job opportunities for landless or the integration of women and marginal groups such as scheduled castes?

- *What do the different actors contribute to the sustainability of the natural resources?*

It is assumed that the new community spirit and the enhanced interactions between the community members have a positive effect on the treatment of natural resources. Did the fresh enthusiasm for development activities not lead to an overuse and as a result to a depletion of the resources? How can the sustainability be guarded?

5. The case of Ralegan Siddhi

5.1. Description of Ralegan Siddhi

The village of Ralegan Siddhi, surrounded by bare and stony hills, impresses as a small, green oasis in the midst of Maharashtra's drylands. Through a remarkable, community-based development initiated by Anna Hazare in 1975, Ralegan Siddhi has become a living model of participatory natural resource management, integrated watershed and rural development. (Mishra, nd)

5.1.1. A brief background

Ralegan Siddhi is located in the drought prone and resource poor area of Parner Tehsil block of Ahmadnagar district, in central Maharashtra (see Fig. 2). The area has a size of 982.31 ha and is characterised by volatile and very little rainfall, ranging annually between 450 and 650 mm, with September reaching a maximum. The village receives rain on approximately 35 days of the year. The temperatures range between 12 and 44 °C. (Mehta and Satpathy 2008; Mishra, nd)

Out of the 980 ha village area, over 300 is not arable. Approximately 194 ha is under forest cover. The landscape of small surrounding hills on the northeaster and southern side and the poor soil quality are keeping water from percolating during the rare but heavy rainfalls. 70 percent of the
soils are shallow, with a maximum depth of only 45 cm. In the lower areas, patches of black soil can be found; towards the higher areas the soils are unfit for cultivation. (Mishra, nd)

Between 1971 and 2001, the number of households in Ralegan Siddhi increased from 178 to 394, with the total population increasing from 1,209 to 2,306 citizens. The female-male ratio declined from 1.029 to 0.82, due to the homecoming of males who had gone to the nearby cities for work and are now returning because of improved socio-economic conditions. (Mehta and Satpathy 2008)

The proportion of literate and educated males increased from 13 to 62 percent in the two decades between 1971 and 1991. However, the proportion of literate and educated females decreased from 47 to 38 percent, even though the number increased over the same period of time. According to the villagers, today no one in the 15-35 year age group is illiterate. The school in Ralegan Siddhi places emphasis on exercises, physical work, sports, as well as the use of computer, to enable children to compete and get jobs. Every child in Ralegan Siddhi is going to school and 95 percent complete the 10th Standard, while the high school completion rate is over 85 percent. (Mehta and Satpathy 2008; Mishra, nd)

Due to proper education about hygiene and sanitation, as well as the provision of safe drinking water within the village, Ralegan Siddhi has of today high hygiene standards and good health indicators. (Mehta and Satpathy 2008)

Scheduled castes and tribes (lower castes) constitute 8.8 percent of the population. Their number decreased between 1991 and 2001, which is an effect of an uncontrolled immigration and the tripling of the scheduled caste population between 1971 and 1991. In 2001, there were 18.3 percent of the 394 households living below the poverty line and 4.3 percent were very poor, compared to 70 percent of the households living below the poverty line in 1971. (Mehta and Satpathy 2008)

The agricultural sector constitutes the main source of livelihood for the villagers of Ralegan Siddhi and has been considerably developed through water harvesting techniques (see Fig. 3 and Table 1). Besides cultivators and agricultural labourers, employment opportunities remain limited. (Mehta and Satpathy 2008) However,
the dairy business evolved and the milk export to other villages rose from around 125 litres a day before 1975 to approximately 3,000 litres today (Hazare 2003). Those working as drivers, cobblers, grocers, teachers, shopkeepers, health workers, flour mill operators, blacksmiths and others represent the services and rural artisans but make out only a small percentage of the village's population. (Mehta and Satpathy 2008; Mishra, nd)

Table 1: Impact of watershed development, key indicators (GOM, nd)

<table>
<thead>
<tr>
<th>Item</th>
<th>Before watershed development</th>
<th>Current status</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cropped area (double cropping)</td>
<td>630.00 ha</td>
<td>956.00 ha</td>
<td>51.75 %</td>
</tr>
<tr>
<td>Cropping intensity</td>
<td>98.00%</td>
<td>164.00 %</td>
<td>-</td>
</tr>
<tr>
<td>Oilseed area</td>
<td>20 ha</td>
<td>134 ha</td>
<td>6 times</td>
</tr>
<tr>
<td>Pulses area</td>
<td>27 ha</td>
<td>96 ha</td>
<td>35 times</td>
</tr>
<tr>
<td>Intercropping area</td>
<td>-</td>
<td>65 ha</td>
<td>&gt; 100 %</td>
</tr>
<tr>
<td>Use of improved seed</td>
<td>50 ha</td>
<td>860 ha</td>
<td>17 times</td>
</tr>
<tr>
<td>Seed treatment</td>
<td>40 ha</td>
<td>410 ha</td>
<td>10 times</td>
</tr>
<tr>
<td>Area of insect and pest control</td>
<td>45 ha</td>
<td>300.58 ha</td>
<td>6.68 times</td>
</tr>
<tr>
<td>Use of chemical fertiliser</td>
<td>8 tonnes</td>
<td>83 tonnes</td>
<td>10 times</td>
</tr>
<tr>
<td><strong>Irrigation area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well irrigation</td>
<td>56.43 ha</td>
<td>447.34 ha</td>
<td>8 times</td>
</tr>
<tr>
<td>Canal irrigation</td>
<td>-</td>
<td>17.40 ha</td>
<td>17 times</td>
</tr>
<tr>
<td>Total irrigation</td>
<td>56.43 ha</td>
<td>464.74 ha</td>
<td>8 times</td>
</tr>
<tr>
<td>No. of wells</td>
<td>34</td>
<td>103</td>
<td>3 times</td>
</tr>
<tr>
<td>No. of community wells</td>
<td>-</td>
<td>5</td>
<td>&gt; 100 %</td>
</tr>
<tr>
<td>No. of electric pumps</td>
<td>15</td>
<td>103</td>
<td>7 times</td>
</tr>
<tr>
<td>No. of oil engines</td>
<td>19</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Average yield of village (as per cropped area)</td>
<td>Rs. 672,000</td>
<td>Rs. 12,815,000</td>
<td>19 times</td>
</tr>
<tr>
<td>Per capita yield (as per cropped area)</td>
<td>Rs. 445.62</td>
<td>Rs. 6465.70</td>
<td>14.50 times</td>
</tr>
</tbody>
</table>

3 As published by Mehta and Satpathy in 2008 in the study “Escaping poverty: the Ralegan Siddhi case”.

45
5.1.2. Ralegan Siddhi before 1975

Before 1975, Ralegan Siddhi was plagued by acute poverty, a fragile ecosystem and moral downfall. Unemployment, alcoholism, indebtedness and corruption found their way in and out of the village and left the people in a desperate situation of neglect, hopelessness and social degradation. Indiscriminate use of natural resources and scarcity of water limited the agricultural practice. Most of the rainwater was lost due to runoff, which led to erosion and consequently to further soil degradation. In 1971, only 22.26 ha land were under irrigation. The water table was below 20 m, the wells dried up during the summer and drinking water had either to be fetched from the neighbouring villages or to be provided by urgency government schemes. (Mehta and Satpathy 2008; Mishra, nd)

Due to the high degree of slopes and the lack of vegetation, surface runoff of rainwater was high and washed away the top fertile soil layer. Not even 20 ha of the village area were under irrigation and not even a single crop per year was assured. As a result, the agricultural production was meagre and the village was able to meet only 30 percent of its food requirements. Until 1975, 70 percent of the households were living below the poverty line and about 45 percent of the villagers had a single meal a day. Contributing to the desperate situation was the fact that half of the households had an average of eight to nine family members. (Mehta and Satpathy 2008; Mishra, nd)

Only 3 or 4 farmers were in the dairy business (Hazare 2003). The dry lands were holding the fodder production low, so that breeding livestock was difficult (Mehta and Satpathy 2008). There was no work available in the village and people migrated to cities for work. Some started stewing liquor, selling it in neighbour villages to earn a livelihood. As it was a relatively successful business, others got attracted and followed. In 1975, there were 40 liquor dens in the village (Hazare 2005). Conflicts and crimes became common. Drunkards filled the streets and thefts and arrests happened on a regular basis. Women were suffering most, as domestic violence became the norm. (Mishtra, nd) Villagers borrowed grain and money on interest, could often not pay back the loans and were caught in a vicious circle of indebtedness. As a result, moneylenders exploited the situation, took the indebted farmers' land and sold it at a profit later on. (Hazare 2003)

Hardly 10 percent of the children attended school (Mishtra, nd). Education facilities were available only unto the fourth standard (Hazare 2003). As there was no school building, classes were held under a tree. Villagers were asked to give money for its construction, but they refused. Due to the
unsanitary conditions and the cleanliness of water, infant mortality and diseases were common. (Mehta and Satpathy 2008)

The community was divided through caste, creed, politics and economic status. The 16 households belonging to a scheduled caste lived in the outlying area of the village and were routinely excluded from daily village life. They were kept from entering the temples, drawing water from the wells and would have to sit separately at community events. The *gram panchayat* was corrupt, governmental schemes aiming at the improvement of the situation turned out to be ineffective while the funds were used by the village leaders for personal benefits. (Mehta and Satpathy 2008)

The severe drought of 1972 made conditions worse in Ralegan Siddhi. Societies such as the Dorabji Tata Trust or the Catholic Relief Society began to work in drought affected villages, including Ralegan Siddhi. Providing wells and check dams, drinking water, fodder, food grain and medical relief could however not reduce poverty and change the socio-economic situation of the village in the long-term. Also the government further funded the construction of a percolation tank, which however, due to faulty design and lack of accountability failed to serve its purpose. (Mehta and Satpathy 2008; Mishra, nd)

5.1.3. Ralegan Siddhi after 1975

When Sri Baburao 'Anna' (meaning 'elder brother' in the local language Marathi) Hazare (see Fig. 4) took voluntary retirement from the army, he returned to settle in his native village. Knowing about the pitiable condition of the villagers he made 'service to the people' his sole aim in life and was determined to make a change. Using the Rs. 20,000 savings that he had from his stay with the army, he started renovating the village's temple, hoping that it would be a good way to bring the villagers together. Seeing this unselfish act, villagers became curious and joined him, either with financial help when they could or simply with manual labour. The concept of *shramdaan*, community labour, was born and a “sense of concern for community work was created” (Hazare 2003, p. 55). People came together in the temple for informal discussions, what later became the *gram sabha* (village assembly), where all kinds of conflicts would be discussed.

![Anna Hazare in the gram sabha](Fig. 4: Anna Hazare in the gram sabha)
It was the work at the temple that brought the villagers together, gave them confidence and a sense of belongingness that paved the way for further development acts. A group of 35-40 youths came together, determined to assist in the reformation of the village, and formed the *tarun mandal*, a voluntary youth society. (Hazare 2003) Understanding that the high number of alcohol vendors arise as a result to the lack of livelihoods and recognising that it was a factor hampering the effective and sustainable development of the village, the *tarun mandal* started educating the villagers about the negative effects of alcohol and promising them new sources of income. Through the following month, most of the liquor vendors abandoned their units voluntarily, while others, under social pressure, followed suit. (Mehta and Satpathy 2008)

The approach that was used by Anna Hazare was mainly aiming at changing people's behaviour, bringing them together and “installing in people's minds a sense of belonging and oneness with the rest of society” (Hazare 2003, p. 15) They could see that through participating in matters that concern the whole community they are able to turn their desperate socio-economic and ecological situation around. It was a village development that started at the level of the individual, reconsidering his place and duty as a member of the community. In village meetings villagers collectively agreed upon and implemented rules, such as: ban on addiction, ban on free grazing and tree cutting to prevent soil degradation, family planning, meaning a family should have a maximum of two children, and the necessity of *shramdaan*.

The rule on family planning and the ban on addiction, just as much as the ban on free-grazing and tree cutting, have been designed to positively influence the natural resource management. Family planning in the context of India's exploding population, which had become a huge problem over the last 50 years, serves as an instrument of taking pressure away from the environment. Furthermore, it is clear that people suffering from addiction will have trouble setting up a sustainable, self-organised natural resource management system. Trying to change the face of the village, the community members have recognised the need of new appropriate institutions which have finally led to a faster process of individual as well as village development.

5.1.4. Natural resources development in Ralegan Siddhi

Scarcity of water and recurrent droughts had been the main problems in Ralegan Siddhi, therefore water conservation measures were the obvious solution. The challenge was to use low-cost techniques that would easily be accessible and applicable to small scale farmers. Anna Hazare went
to Pune to meet with scientists and scholars at the Pune University and learned about Vilasrao Salunke's *Pani Panchayat* model of “*pani adawa, pani jirawa*”, which means as much as trapping the rainwater wherever it falls. (Mehta and Satpathy 2008) This would enable a conservation of soil through a decrease of runoff water and an increase of on-spot infiltration which would entail an area-wide rise of the groundwater table.

As employment possibilities were missing in the village, it was necessary to achieve immediate results. Water harvesting should enable farmers to get higher yields and cultivate two crops a year. As a first step six *nala* bunds, small check dams, were constructed by the villagers who were motivated to collectively offer their working forces to cut implementation costs. The *nala* bunds stopped water runoff in major drainage lines, improved percolation and consequently improved the returns from farming activities in the village to a considerable amount. (Mehta and Satpathy 2008) Between 1975 and 1981, 45 mud canal bundings, one percolation tank (see Fig. 5), tree plantings (see Fig. 6) and many other projects were managed and implemented by the villagers without any outside assistance. Some restrictive State norms, however, did not allow informally organised farmers to implement all of the envisioned projects despite the availability of sites and knowledge, so that many further projects - 16 gabion dams, 5 cement dams and staggered trenches - were initiated in cooperation with the organisation CAPART (Council for Advancement of People's Action and Rural Technology). In Ralegan Siddhi, where initially 150 acres of land were cultivated with water from wells, 1,500 acres started getting enough water for cultivation. As a result, the same poverty plagued village and people were able to become self-sufficient without any donation or foreign funding. These early projects and life-changing achievements enabled a whole process of individual as well as community development that would change the picture of the village until today and probably many more years to come. (Hazare 2003) It is this bottom-up approach, where the planning is done by the people, for the people and of the people, that has installed a sense of self-assurance and self-determination in the minds of the villagers, who would, even after the
government chose to give them financial assistance, not let go off their right of ownership of their own resources.

It was in 1982-1983 when the government selected Ralegan Siddhi as a model village under the COWDEP. While the government invested into new projects and further developments, the villagers made sure they stayed in charge of their development in organising and planning their activities, delivering *shramdaan* and sharing the implementation cost. Under the program, 31 *nala* bunds (see Fig. 7) were constructed and an area of 605 ha with a storage capacity of 282,182 m³ was covered. Further, contour bunding and land levelling was undertaken. Because of the governmental lack of accountability and monitoring during and after the implementation process, the villagers of Ralegan Siddhi organised themselves under the *shramdaan* initiative to supervise the projects and make sure that all parties would stick to the engagements. (Mehta and Satpathy 2008)

The second great task that was envisioned by the villagers was the renovation of the percolation tank, which was, as mentioned earlier, built by the government in 1975. Due to technical fault and lack of supervision, the collected rainwater used to drain away and the tank was able to store water for a maximum of two month. The *zilla parishad* (district council) agreed in 1984 to pay the renovation cost of Rs. 3.91 lakh (1 lakh = 1,00,000), while the villagers took on the labour costs. Each villager, except the very poor or very old, would offer one day of *shramdaan* every 15 days. Through this act, local monitoring could be guaranteed and a sense of participation and ownership was developed. “The villagers were not passive beneficiaries of donations and government grants but active participants in its use.” (Mehta and Satpathy 2008, p. 15) Trees were planted around the tank to decrease the evaporation rate and enhance the percolation process. (Mehta and Satpathy 2008)

Once the groundwater table was rising through the increased percolation, the villagers decided to dig wells (see Fig. 8) along the flow of the groundwater. As 80 percent of the farmers did not have the financial means

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Fig. 7: Nala bunds

Fig. 8: Ralegan Siddhi’s largest well
to dig their own well, they started the concept of “cooperative societies”. The first community well was constructed by 16 poor landowners to enable them to irrigate their 35 acres of land. 50 percent of the cost was met by themselves through *shramdaan*, while Anna Hazare borrowed them the remaining 50 percent. Over the following two years, the villagers constructed seven community wells on a cooperative basis. These community wells enabled the cultivation of two crops a year through irrigation on 700 to 800 acres of land. The largest well in Ralegan Siddhi today is 70 feet deep, belongs to 26 farmers and provides irrigation water for 125 acres of land. Through the measures enhancing the rainwater infiltration into the soil, water is available in the wells all throughout the year and, as a result, the average yield increased by a fivefold. (Mehta and Satpathy 2008)

An additional supply of water was provided when a lift irrigation system was installed to lift water from the 200 km Kukadi canal which flows at a distance of 3 km from Ralegan Siddhi. The canal is built on a tributary of the Krishna River. Before Ralegan, more than 100 lift irrigation systems had been connected to the canal. Except for the cooperative society in Ralegan Siddhi, the Krishna Pani Purvatha Society, all had failed. Loans for the installation of the lift irrigation system were taken at two instances: in 1986, Rs. 21 lakh by the initial 103 participants, who had their combined fields of 525 acres irrigated; and in 1992, Rs. 9 lakh more where borrowed to increase the irrigation area and add new pipelines and pumps. Labour worth Rs. 3 lakh was provided through *shramdaan*. Today the scheme, organised and managed by the Krishna *pani purvatha* (water society), covers 700 acres of land in four villages. The society is a cooperation distributing the water and has 260 active members. Every three years, 11 are chosen as directors and make up the committee. The cooperative meets once a month and all the members meet 3 to 4 times a year. The administrative system and the transparency of the rules have contributed to the successful implementation of the lift irrigation system, while a hundred others, previously connected to the same canal, have failed. Even though some household withdrew, not being able to benefit as much as possible because of gravity-related problems, today, the Kukadi canal supplies about 40 percent of the village's water needs. The loans that had been taken for the installation had been returned with an interest of 16 percent by 2001. (Mehta and Satpathy 2008)

For the proper and effective organisation and planning of the projects, the village area of 2,200 ha was divided into four watersheds. Between the highest topographical point of the watershed and the lowest lie about 75 m. The percentage slope of the watershed varies from 3 to 25 percent. Each watershed is again divided into three parts: the upper reaches, which are the runoff zones, the
middle reaches, which are the recharge zones, and the lower reaches, which are the storage zones. The drainage lines were treated first, while arable and non-arable lands have to be treated according to their capacity. The approach used in Ralegan Siddhi is an integrated one, where the management of water, land, forest, livestock and the needs of human beings are all considered equally regarding their interrelationship. In this regard farmers have to cooperate and be ready to change the use of their land according to what will benefit the whole village. The methods and measures used in Ralegan Siddhi are of the following categories:

- *Alternating land use*

In order to use a watershed to its full capacity, a proper land use has to be planned and the interests of the farmers have to be attuned to each other as well as to their respective land. Land in the upper reaches of the watershed is mostly not fit for the cultivation of annuals. These non-arable lands in Ralegan Siddhi were turned into *grasslands* (see Fig. 9). Grass cultures improve the soil structure and the rainwater infiltration into the soil.

*Fig. 9: Grassland development*

Bushes, shrubs or trees, often fruit trees to bring an additional income to farmers, were planted. The grass yields from these lands are used for stall feeding of the farmer's own livestock or they are sold to farmers in the dairy business. Today, Ralegan Siddhi has 500 acres of grassland.

In Ralegan Siddhi the villagers, including the school children, participated in *afforestation* efforts on marginal lands. Almost 4 *lakh* of saplings were planted. Before developing their own nurseries in Ralegan Siddhi (see Fig. 10), where mango trees are nurtured, the Forest Department provided the village with free saplings and money for labour under the Social Forestry Program (Narain and Agrawal 2002).

*Fig. 10: Nursery in Ralegan Siddhi*

The *gram sabha* in Ralegan Siddhi imposed restrictions on the *crop selection*, banning the cultivation of water-intensive crops such as sugar cane and bananas. (Mehta and Satpathy 2008)
Today, with an increased availability of water, the cultivation of sugar cane is allowed on small parts of land, however, always discussed in the gram sabha.

- **Rainwater harvesting and groundwater recharge structures**

As mentioned earlier, *nala bunds*, earthen or made of cement, were installed in the drainage lines to serve as check dams increasing infiltration and decreasing erosion and mud transportation in the drainage lines. *Loose boulder structures* in small drainage lines slow down the flow of water and collect the eroding mud, which again can be used by the farmers on their fields. Bigger *cement, gabion* (see Fig. 11) and *sub-surface structures* were erected in bigger drainage lines to increase infiltration, consequently recharge the groundwater, and to store water that could be used for irrigation. *Gully plugs* along drainage lines, in small streams or on hill slopes, are small dams mostly made of dry stones stabilising the grades counteracting erosion.

Mainly in the upper and middle reaches on slopes, where the soil has relatively good infiltration, *contour trenches* of 60 cm width and 30 cm depth were dug to collect the runoff water and make it percolate. The distance between the trenches depends on the grade, with the distance being higher the lower the percentage of the slope. In some instances, tree plantations were undertaken along the trenches, so that the mud collected in the trenches boosts the growth of the trees, while the trees provide stabilisation for the soil. Effective and often applied is the method of *continuous contour trenching* (see Fig. 12), where the trenches girdle around the hill slopes and provide a areawide infiltration of rainwater into the soil.

Particularly in the lower reaches, percolation tanks were built to collect the water that reaches through the drainage lines to the lower parts of the watershed. Here the water is stored, can be used for irrigation and percolate into the soil in order to recharge the groundwater.
Land levelling and in-situ conservation practices

On moderate or steep slopes land levelling was undertaken to alleviate the cultivation of the land, stop runoff water, enable infiltration and consequently prevent erosion.

Field bundings, mostly contour stone walls or hedges (see Fig. 13), were installed, often on the upper reaches. These in-situ conservation practices are traditional low-cost techniques and serve as wind and runoff breaks and increase infiltration. Additionally, villagers were encouraged to improve their agricultural practices, like proper land treatment through horticulture development and usage of alternative, water conserving irrigation techniques like drip irrigation. Although the drip irrigation is expensive, farmers managed to collectively take loans and implement it to produce papaya, lemons and chillies on 80 acres of land. (Mehta and Satpathy 2008)

Lift irrigation schemes

The combination of these methods gave rise to the groundwater level, which has been at minus 20 m in the rainy season before the watershed development was undertaken and is at minus 6 m all throughout the year today. Consequently, the digging of wells, as explained earlier, was the logical step to be taken next, to enable farmers to benefit from the increased water availability and directly use the water for irrigation. Many of the wells were connected to electrical pumps to lift the water to the surrounding fields.

These wells, along with the lift irrigation system connected to the Kukadi canal, also mentioned earlier in this chapter, provide a more technical and cost-extensive water supply system. Through a collective, well-organised management, the user groups in Ralegan Siddhi succeed to sustainably manage these water resources which today enable the cultivation of two, sometimes three crops a year.
• Social fencing

The villagers of Ralegan Siddhi collectively decided to undertake a ban on free-grazing and tree cutting. Free grazing was replaced by the practice of stall feeding with cultivated fodder from the newly developed 500 acres of grasslands (see Fig. 14). As a result the quality of the fodder got better and the productivity of milch animals increased. (Mehta and Satpathy 2008) The ban on tree cutting made the villagers use kerosene for cooking, taking away a lot of work load from the women who previously had to collect the fuel wood for cooking. Both restrictions were necessary for the afforestation program to be successful.

The financial contributions (see Table 2) to the watershed development program have been as followed: 48.43 percent by the villagers themselves, 44.83 percent by the Jal Sandharan Department, Government of Maharashtra, and the remaining 6.74 percent by the Rural Development Department. (Narain and Agrawal 2002) Along with financial contributions, the villagers committed to shramdaan or offered their own land for constructions such as dams for the benefit of the community. Anna Hazare himself contributed Rs. 87,000 to set an example. (Mehta and Satpathy 2008)

Table 2: Expenditure on different soil conservation and watershed management tasks (FRCH and CMDR 2002)

<table>
<thead>
<tr>
<th>Name of activity</th>
<th>Implementing agency</th>
<th>Work done</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour bunding</td>
<td>Soil Conservation and Watershed Management (SCWM)</td>
<td>591.27 ha</td>
<td>Rs. 148,000</td>
</tr>
<tr>
<td>Land levelling</td>
<td>SCWM</td>
<td>182.94 ha</td>
<td>Rs. 606,000</td>
</tr>
<tr>
<td>Afforestation and pasture development</td>
<td>SCWM</td>
<td>152.95 ha</td>
<td>Rs. 209,000</td>
</tr>
<tr>
<td>Nala bunding</td>
<td>SCWM</td>
<td>32 nalas</td>
<td>Rs. 820,000</td>
</tr>
<tr>
<td>Afforestation</td>
<td>Forestry and Social Forestry Department</td>
<td>117.00 ha</td>
<td>Rs. 668,000</td>
</tr>
<tr>
<td>Percolation Tank</td>
<td>Minor Irrigation Department</td>
<td>1 tank</td>
<td>Rs. 883,000</td>
</tr>
</tbody>
</table>

Fig. 14: Grassland on the hilltop
5.2. Analysing and evaluating the case of Ralegan Siddhi

5.2.1. Managing the problems of supply, commitment and mutual monitoring

In Ralegan Siddhi, the incentive of supplying new institutions came from Anna Hazare in 1975. Seeing the village in the miserable state it was in at that point of time was enough reason for him to demand a change. The problem of why new institutions are supplied as well as the problem of commitment are often more obvious in a situation where there is hunger, poverty and hopelessness amongst the people than amongst wealthier individuals, owning substantial assets while trapped in a situation of common resource degradation. In his book *My Village – My Sacred Land*, Anna Hazare (2003) writes: “Twenty-five years ago, Ralegan Siddhi faces a shortage of water food and other basic necessities of life. Because of these needs and difficulties, they did as they were told” (p 35).

However, despite the desperate situation, governmental schemes were not able to bring a change as they were not addressing the social and mental state of the community members. The people were not integrated in the process and as a result did not see themselves as part of the projects. Thus, the leadership of Anna Hazare, as a member of the community making positive outcomes become visible, was necessary to make the villagers commit themselves, seeing the possible benefits as a way out of poverty.

Furthermore, most of Ralegan Siddhi’s community members depend on agriculture as their livelihood and as the scarcity of water and soil erosion were the major problems, they shared a common interest. Consequently, the questions on what resource to develop and what rules would be

<table>
<thead>
<tr>
<th>Nala bunding</th>
<th>Social Institute of Ralegan Siddhi</th>
<th>18 nalas</th>
<th>Rs. 3,058,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small bunds</td>
<td>Social Institute of Ralegan Siddhi</td>
<td>5 in no.</td>
<td></td>
</tr>
<tr>
<td>Gabian structure</td>
<td>Social Institute of Ralegan Siddhi</td>
<td>4 in no.</td>
<td></td>
</tr>
<tr>
<td>Well and canal lift irrigation scheme</td>
<td>Social Institute of Ralegan Siddhi</td>
<td></td>
<td>Rs. 544,000</td>
</tr>
<tr>
<td>Drip irrigation</td>
<td>Zilla parishad</td>
<td></td>
<td>Rs. 442,000</td>
</tr>
<tr>
<td>Special scheme</td>
<td>Zilla parishad</td>
<td></td>
<td>Rs. 59,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>Rs. 7,437,000</td>
</tr>
</tbody>
</table>
necessary could easily be answered. New institutions that restrict the appropriation activities from natural resources can be expected to be implemented when there are visible indicators of resource degradation and when the members of the community expect the benefits devolved from the change to be higher than the invested costs (Ostrom 1990).

As the whole community took part in the decision making process, the self-determined rules were well known and understood around the community, so that most villagers were voluntarily following them in high confidence that they would contribute to their own well-being. The high commitment of groups such as the tarun mandal resulted in a strict monitoring of other members, who had trouble with integrating these new rules into their daily routine. After some initial problems, the monitoring was increasingly practised on a mutual basis, as no one wanted to be the “sucker”, breaking the rules that they have made themselves.

5.2.2. Analysis and evaluation of Elinor Ostrom's design principles

The dramatic change that took place in Ralegan Siddhi has created a village that has been characterised by a stable and robust natural resource management system for the last 35 years. The socio-economic and environmental situation has been sustainable due to people's commitment and participation combined with leadership, well organised project planning and implementation as well as governmental assistance providing parts of the funding. On the following pages the institutional and organisational situation of Ralegan Siddhi shall be assessed according to the eight design principles developed by Elinor Ostrom and explained in chapter 4.3.3., to see whether the structures follow these characteristics of robust natural resource governance systems.

1. Clearly defined boundaries

Farmers that have their agricultural field in the same watershed area join together in user-groups (UG) to manage their lands and maintain the watershed structures such as bunds, dams and trenches. The several community wells are also managed by the respective UG, so that all members know who they belong to and who is allowed to use them. The water provided through the lift irrigation system from the Kukadi canal is distributed by the cooperation Krishna pani purvatha, whose members are the land owners themselves. A price is charged per unit of water used. If a farmer does not pay for the water used, his supply is cut.
Ralegan Siddhi has, with the ban on free grazing and the ban on tree cutting, two major rules to protect and conserve the natural resources. These are known and followed by every member of the community. People are allowed to get firewood and fodder either from their own fields or to cook on kerosene and to buy fodder from community managed common lands or from farmers cultivating fodder for selling. This rule has been successfully implemented in order to allow the development of forest area and stop erosion on slopes and unproductive lands.

2. Congruence between benefits and costs

In the organised UG the farmers decide for themselves how much and when water can be used for irrigation. As water shortage is no longer an issue, not even in the dry month before the monsoon rains, people are no longer restricted in the amount of water they use. However, to ensure the sustainability of this success, they are only allowed to grow water intensive crops such as sugar cane and bananas on small areas of land. When and where is decided by the community during the gram sabha.

3. Collective-choice arrangements

The gram sabha is held on a regular basis, more than once a month. Every villager is invited to assist the village assembly and to speak his mind. During the process of institutional change in the village, all the rules and project plans are decided during these community meetings. From then on, villagers have been coming up with new ideas and modifications, that are approved by the gram sabha and are implemented afterwards by the community. This gives the people a feeling of ownership. Women are also present during the gram sabha. To ensure their integration, there are a number of gram sabhas restricted to only women, for them to discuss their own matters of concerns that can later be integrated into village discussions. Even though it may be noticed that the same few people are talking and taking decisions during the gram sabhas, yet most people are present during these meetings and, as a result, are aware of activities and decisions.

4. Monitoring

Many of the rules followed in Ralegan Siddhi are not national rules, but exist only on the village level. They are implemented, monitored and enforced not by a central authority, but by the villagers themselves. The high number of village based groups, societies and cooperatives ensures a reliable
system of mutual monitoring as major infractions are easily noticed. As a result, the cost of monitoring is low. Insignificant infractions are not necessarily taken to court (which is the gram sabha as well), while major infractions are rare and resolved by the community itself.

5. Graduated sanctions

Sanctions given to rule infractions are not severe and are mostly discussed during the community meetings. Infractions to the rules on free grazing and tree cutting are balanced through monetary sanctions of Rs. 500. As the villagers do not lack firewood nor fodder, they can easily abide to this rule. If a family that profits from a shared facility fails to contribute shramdaan while the facility is constructed, it is obliged to pay Rs. 100 a day during the construction phase (Hazare 2003).

From the time that the ban on addiction has been in place, no shop has sold any alcohol, cigarette or beedi, and no one has been caught drinking or smoking in the village. Some people, however, go to the neighbouring villages and come back drunk. On this incidence, the gram sabha decided that they will be counselled for the first two offences. For the third violation they will have to swear at the temple to never do it again. If they violate the rule a forth time they would be tied to a pole at the village square.

In the case that a family ends up having more than two children, they will be excluded from elections. So a lot of young men in the village undertake sterilisation after having their second child.

6. Conflict-resolution mechanisms

All conflicts are discussed and resolved during the gram sabha in the village temple. Whenever conflict becomes a matter of concern, the villagers are called for a meeting. Consequently, the gram sabha may take place several times in a month. Even though the villagers come up with new ideas and lead the discussions, it is obvious that Anna Hazare still plays the major role in the conflict-resolution scenario. It is him that is always asked for advice when there is too much diversity of opinion or friction.

7. Minimal recognition of rights

The Maharashtran government had set up a number of watershed development as well as rural
development action plans that were not able to produce major success stories. In 1982-1983, during the COWDEP, Ralegan Siddhi was chosen as one of the villages to be supported in their development (Mehta and Satpathy 2008). It is thus obvious that the State recognises Ralegan Siddhi as a successful model of holistic rural development and as a result also the village's rights of self-organisation. Even though the villagers, through shramdaan and monetary contributions, are able to secure the greatest part of ownership for most of the community facilities, it is clear that the national and State government contributes a fair share of funds to the early development of the village.

8. Nested enterprises

In a watershed and natural resource management system of Ralegan Siddhi's size, having a population of 2,500, it is important for the community members to organise themselves on various levels. In Ralegan Siddhi, the village council and especially the gram sabha is on the highest level of governance, monitoring actions and interactions of societies and organisations forming the medium level. These organisations are coordinating the activities and cooperation between the smaller user-groups and the higher village council.

In Ralegan Siddhi there is a high number of societies, organisations and cooperatives. On the lowest level are the UG and the SHG, each consisting of 8 to 16 members sharing the same areas of interest. While the UG consist of members that share farm and watershed related areas of interest, the SHG get together for engaging in non-farm related livelihoods. The UG, which operate on the watershed level, manage for instance a common well or a drainage line with dams or bunds. They can take loans as a group or open a bank account to earn interest on their deposits. SHG may take loans to acquire cattle to get into the dairy business or they learn to manage their money in a beneficial way to engage themselves in other kind of businesses.

The UG, in their respective watershed area, plan, implement and monitor their actions themselves. As the major watershed development measures in Ralegan Siddhi are over, maintenance of these structures has become their main collective activity. The UG are backed and supervised by the Hind Swaraj Trust, an NGO that provides technical assistance to farmers. Its main purpose as a Project Implementation Agency is the training of villagers and members of NGOs from all over India to initiate replications of Ralegan Siddhi's watershed development success story. Besides the watershed activities in Ralegan Siddhi, it is assisting and supervising four other villages in
Ahmadnagar district. The Krishna pani purvatha, mentioned in chapter 5.1.4., is a cooperation that distributes the water from the Kukadi canal, is a society in which the members are the users themselves. They monitor the lift irrigation system and discuss changes by themselves. (Mehta and Satpathy 2008)

Besides these two organisations in the field of natural resource management at the medium-village-level, there are many more societies organising all kinds of activities. For instance, today's responsibility of the tarun mandal is the organisation of all kind of village festivities, such as community marriages or religious celebrations. In the early years of Ralegan Siddhi's development, the tarun mandal started the initiative of a grain bank. The purpose of the grain bank was that the farmers with surplus production would provide grains for resource poor farmers, who had not enough to make it through the year. Those that were supplied with grain from the bank had to pay an increased amount of grains back the coming year. Over the years, however, the grain bank was not needed any more and was given up.

Other village-based organisations are for example the shikshan prasarak mandal (education society) looking after the educational system, the mahila mandal (women's society) organising and furthering activities of women in the village, the dudh utpadak sanstha, which is a dairy cooperative. All of these organisation take part in the gram sabha so that all villagers know what are their activities and what is their progress.

5.2.3. Evaluation of the outcomes and the sustainability of the social structures

- Economic efficiency

Through the water conservation measures, the groundwater level was recharged from 20 m during the rainy season before 1975 to approximately 6.5 m depth all throughout the year. (Mehta and Satpathy 2008) This enables farmers to cultivate at least two crops a year instead of one that was not even guaranteed. As a result, the agricultural production rose from 294.3 tonnes in 1975-1976 to 1386.2 tonnes in 1985-1986, which is a 4.7 fold increase in quantity and a 9-fold increase in value. Consequently, as Table 3 displays, the net income generated from agricultural production rose from Rs. 345,910 to Rs. 3,172,678 in those ten years. The Department of Agriculture reports that the average yield per hectare increased almost 19 times, with a corresponding increase in the per capita earnings of the village by nearly 15 times. In the decade from 1975 to 1985, the overall income
generated from other businesses increased from Rs. 12,000 to Rs. 36,000 and the income from salaried jobs rose from Rs. 48,000 to Rs. 1,080,000. (FRCH and CMDR 2002) Today, Ralegan Siddhi has only a few landless people who work on daily wages and most of them came from outside as they heard about the high payments and number of jobs for labourers. Thus, it is safe to say that the village has gone through a dramatic rise in economic efficiency and all people take profit out of it according to their means.


<table>
<thead>
<tr>
<th>Details</th>
<th>1975-1976 Income</th>
<th>% of total</th>
<th>1985-1986 Income</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income generated from agricultural production</td>
<td>Rs. 345,910</td>
<td>85</td>
<td>Rs. 3,172,678</td>
<td>74</td>
</tr>
<tr>
<td>Profit generated from other business</td>
<td>Rs. 12,000</td>
<td>3</td>
<td>Rs. 36,000</td>
<td>1</td>
</tr>
<tr>
<td>Income generated out of salaried jobs</td>
<td>Rs. 48,000 (ca. 20 persons)</td>
<td>12</td>
<td>Rs. 1,080,000 (ca. 90 persons)</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>Rs. 405,910</td>
<td>100</td>
<td>Rs. 4,288,687</td>
<td>100</td>
</tr>
</tbody>
</table>

• Equity

Emphasis was laid on equity during the whole process of development. Water is regarded as a common good and is managed, regulated and used equitably and judiciously by the people themselves who are organised in cooperatives and societies. (Narain and Agarwal 2002) Fiscal equity is provided through the organisation of user-groups. The farmers who join together to build a well manage and use it commonly. Decisions regarding the area to be irrigated, the quantity of water to be used and the crops to be grown are taken collectively. Redistributional equity is guaranteed through the landless' access to the commons. These are, for instance, the numerous hand-pumps or the community wells. A pipeline system was laid by the villagers themselves through shramdaan and their own financial contribution without any governmental funding. No one in the village has to walk more then 100 m to fetch water. (Hazare 2003)

As the consideration of the whole village as one is important for the planning of a well-managed watershed, every land should be treated and used according to its capacity. As a result, it is not possible that every landowner benefits equitably from the measures taken. However, as the whole village benefited, everybody, including the poorest of the poor, was left better off than before and profited according to his or her possibility. As mentioned earlier, daily wage labourers do not go
jobless in Ralegan Siddhi, as the village's population rises due to the good job opportunities.

- **Adaptability and robustness**

Through the successful development of the watershed area, Ralegan Siddhi seems to have overcome the problem of water scarcity. Even in the dry season, water in the wells is abundant. The ban on cultivating water-intensive cash crops enables a more frugal handling of the resource. As a result, the village did not have to prove its adaptability to water shortages even during years of little rainfall. However, the institutional diversity within the village and the strong leadership of Anna Hazare have proven to find solutions to different problems, such as helping out the poor when their yield fell short. Through the common sense developed among the villagers and their will to do voluntary work for the community's good, Ralegan Siddhi has built up a robust economic and ecological system. The villagers know that their success is the result from their own effort and they will probably not cease in putting in even stronger efforts. The only matter of concern for Ralegan Siddhi seems to be the question of how the village may proceed without their strong leadership. This point will be discussed further on.

- **Accountability**

Through the *gram sabha* the community has a common platform to address each and everyone's concerns. A statement that is made during the village assembly will be heard and known by all, so that opportunistic behaviour of some individuals will spread amongst the villagers and will, consequently, be monitored more thoroughly. As the members of the different groups and organisations as well as their representatives are villagers themselves, they are easily accountable to all. Furthermore, the presence of these organisations in the village increases the amount of information that is available to the villagers about the effectiveness of their resource management.

- **Conformance to general morality**

In any collective-choice system of the size of Ralegan Siddhi, it is possible and probable that some will be able to misuse a situation in order to reap more benefits out of it than others. As mutual monitoring and the accountability of officials is high in a system where the users' actions are interdependently linked, it is difficult, however, to gain significant advantages out of cheating and
remain undetected by others. Consequently, those that are detected will suffer a loss in status within the community and will therefore be left in a situation worse than before. People that abide to the rules and norms of the community will enjoy a higher personal status and those who repeatedly cheat and are not willing to follow the rules are asked to leave the community (Hazare 2003).

5.2.4. Community spirit and commitment

An incident that is quite famous around the villagers and displays their togetherness took place when a family of a scheduled caste took a loan from the State Bank of Maharashtra to take on watershed development measures on their lands and ended up with a debt of Rs. 60,000. The bank was about to take their land and their house in order to repay the loan, so the villagers of Ralegan Siddhi called out for a gram sabha to collectively come up with a solution. They decided that all the members of the village will alternately contribute voluntary labour on the land of the dalit (literally: oppressed) family, cultivating crops and collecting the proceeds. After two years, the family was able to repay their loan and to keep their land. (Hazare 2003)

Today, caste discrimination is abolished in Ralegan Siddhi. This does not mean that classes are abolished, as there are rich people, a major middle class and some daily wage labourers. However, no one has to go without water or food and no one is excluded from any activity because of his caste. In many Indian villages, where caste discrimination is practised, caste-related seating arrangements are made during gram sabha or other festivities. In Ralegan Siddhi, such rules do not exist, as every person is regarded as an equal citizen.

At this point, it may be important to highlight some further achievements or specifics of Ralegan Siddhi, as it is the people's commitment to social service that made the village what it is today.

A natural resource management system or the development of a watershed can never be regarded as separated from social and behavioural factors. Therefore, these factors should not be left out by an analyst or planner. For a self-organised, long-enduring natural resource management system, community building and commitment are just as important as technical knowledge.

Anna Hazare has always made clear, in words as well as in deeds, that everybody has to contribute labour as well as money to make village development go hand in hand with human development. (Hazare 2003) Only through this achievement the villagers are able to change their economic status
as well as their behavioural attitude. The village clearly owns its success to three major factors: first, it is the leadership of Anna Hazare; second, it is the contribution of the villagers; and the third point is the financial contribution from the government and the bank loans taken by villagers. Anna Hazare (2003) writes, “[t]here is no harm in profiting from government schemes, after all it is public money” (p. 33). He makes however clear that a fair share of contributions from the villagers is necessary for them to acquire ownership over the achievements. The reason for the lasting success of the projects is due to the villager's effort. (Hazare 2003)

A school building (see Fig. 15) of Rs. 22-23 lakh has been build all by the villagers, without governmental grants or any kind of donations. The government later decided to give Rs. 5 lakh for educational facilities for students from outside. The village came together for voluntary work and constructed a building worth Rs. 18-20 lakh. In 2001, a new hostel building worth Rs. 28 lakh was put up, again without grants or donations. (Hazare 2003) Many more buildings, such as the post office, the gram panchayat building and a clinic were all build by the villagers and, today, the government is paying Rs. 5 lakh every year on rent to use these facilities. The money goes into a village fund that is used for further developments.

Whenever people contribute voluntary labour or money either for construction works or for a village festival (see Fig. 16), a list with the names of those who contributed is set up. This list is presented at the gram sabha, or, while undertaking major constructions, it is displayed on a board in the village, for everyone to see. As a result, all villagers will know who is participating, and those who do not will feel left out and follow suit. People who cannot contribute physical labour will come up with money and vice versa. If there are people who cannot contribute at all, their case will be explained during the gram sabha and respected by other villagers.

The school of Ralegan Siddhi is attended by approximately 1,000 students, of which 350 kids from
all over Maharashtra stay in the hostel. These are all students who failed classes in their local schools, which are given preference to admission. They achieved a passing rate of 97 percent in the 10th standard examination and 93 percent in the 12th standard examination in the Ralegan school. The most obvious difference was the change in their general conduct. Some of them reached a national level in sports. (Hazare 2003) The other 650 student come either from Ralegan Siddhi itself or from neighbouring villages. The day starts with singing. Sports are practised by boys and girls equally and school books are given for free to the students. Shramdaan in part of the school program as every class contributes labour for construction, conservation or tree plantations in the village. A nursery, where mango trees are grown, is run by the school itself.

When agricultural production increased and the dairy business got developed, the villagers were enabled to make further investments, so that the people of Ralegan Siddhi decided in 1998 to establish a credit society, the local cooperative bank. 400-500 community members became stakeholders. Initially, it was a non-agricultural bank, where individuals or groups could deposit money in order to build capital or take loans for development works, marriages, education or medical expenses. (Hazare 2003) Through this credit society, villagers could stay away from a lot of problems faced at the nationalised banks. The members of the society know each and every villager, their needs and capabilities to take a loan. Whenever somebody is not able to pay back in time, the case is discussed and solutions are taken collectively. The profits gained by the credit society go into construction works concerning the whole village.

In the Indian tradition, families pay a lot of money for their daughter's marriage. In villages, it often happens that the parents sell their land or place themselves in debts to make a marriage come true. To reduce this pressure on families, the villagers of Ralegan Siddhi started the idea of community marriages in 1978-79. These marriages include poor and rich couples. Through this practise the marriage costs are reduced, as every family pays according to its capabilities. (Hazare 2003)

Some community members came up with the idea of celebrating a Village Transformation Day, to bring the community further together. They decided to celebrate the event on October 2nd, which is Mahatma Gandhi's birth anniversary, and a national holiday in India. On this day, new born children are welcome to the village community with a set of clothes. Girls from outside the village, married to men from Ralegan Siddhi, are welcomed with a gift as well. The eldest man and woman of the village and students with outstanding merit are honoured. This program was adopted by several other villages as well. (Hazare 2003)
Throughout his life, Anna Hazare has received awards from governments, from the World Bank and other organisations. Some awards were in the form of money, so that he could save Rs. 18 lakh. This money is kept in a bank, earning an interest of Rs. 2 lakh a year, which is distributed as honorarium to villagers who have contributed outstanding social services during the year and shall encourage others to follow. (Hazare 2003)

5.2.5. Possible threats to Ralegan Siddhi’s sustainability

Though the village has known a considerable and equitable rise in economic efficiency and though it has proven its robustness and sustainability over the last 35 years, one major point, or question, remains a cause for concern.

Ralegan Siddhi seems to rely on a robust governance system. People are proud of their achievements and of their own contribution and participation. The students learn about their village's history and about its importance and influence on national development policies and governmental action plans. Many of them seem to engage in the promotion of community building and watershed development after their studies. Every week, there are groups of teachers, employees, social workers and students visiting the National Training Centre for Watershed Development run by the Hind Swaraj Trust, to learn about watershed management and social organisation. Anna Hazare (see Fig. 17) has become famous all over India after Ralegan Siddhi's rise from poverty. It is true that he owns this also to his successful struggle for the introduction of the Right to Information Act, adopted by the government in 2005, as well as to his anti-corruption movement. The students and the villagers know the importance of his work. However, even though gram panchayat elections take place and the villagers run the gram sabha by themselves, one can not ignore Anna Hazare's leadership, his authority in conflict resolution and his role model image within the community.

Because of Ralegan Siddhi's rising fame, people from outside show interest in making investments in the village, others propose donations. The villagers of Ralegan Siddhi have already turned down a donation of Rs. 50,000. (Hazare 2003) In all these brave and self-determined acts, they are always
guided by Anna Hazare himself, who, through his strong personality, makes the people follow him in all he does or says. The question arises whether the majority of them will be able to keep their commitment to community development and selfless service, and whether they will be able to discriminate by themselves between what is fostering and what is hampering their sustainability, after their leader will have gone. There is no doubt that some will try to raise capital out of a convenient situation. Corruption is widely spread in India, in the cities as well as in the villages. Even the government has been following the assignments of Anna Hazare throughout all these years and may, after he will have gone, try to take over the governance of the village. The villagers may start taking external funds for facilities that may not fit in the social and cultural environment. They may simply accept suggestions to grow water intensive cash-crops, such as sugar cane, thinking that they are moving a step forward. All these are questions and assumptions that may be asked, but cannot be answered at this point of time.

Such questions have, however, been asked many times to Anna Hazare himself. Humbly he explains in his book (2003) that “[w]hether it is an ideal, an individual, a family, a village or a nation, it is not constant. History has proven this. It is a cycle of change – from good to bad and from bad to good [...]” (p.35). He continues saying that even if efforts are made to keep the success story alive, there can be no guarantee. However, “[e]ven if an ideal loses its importance in one place, it is essential to have it from the social and national angle” (p.35) and to make it a best practice example for other villages to follow.

5.3. Ralegan Siddhi in a wider context

5.3.1. Is Ralegan Siddhi a model village?

Consequently, another important question arises: can Ralegan Siddhi be regarded as a true model village? Being a precursor in successful watershed development, the national government has given Ralegan Siddhi a lot of attention and monetary assistance. This will surely not be the case, at least not to this extent, for the hundreds of other villages that are expected to follow the model of Ralegan Siddhi.

It is however important to see the villagers of Ralegan Siddhi as a rather large group of individuals, that initiated the process of development on their own, showing that they are willing and able to bring a change. Seeing this, the government has followed – not vice versa. The case of Ralegan
Siddhi confirms the claim that sustainable development should start in the village itself, at the level of the individual and the individual's interaction with a related group. If the government intends to bring about a substantial change in the socio-economic and environmental condition of the country and its people, it is its duty to educate individuals and to empower collective action and decision making at the village level.

So the case of Ralegan Siddhi may not be the model that will easily be replicated in many more villages. Leadership, especially like the one of Anna Hazare, will not simply come into being and the government may not be able to further every village in the way it furthered Ralegan Siddhi. However, “[i]t is such projects that inspire other villages, which set an example for the rest.” (Hazare 2003, p. 36) This is what Ralegan Siddhi wants to be, an inspiration for further replications.

5.3.2. Replications

The village of Hivre Bazar, also located in Ahmednagar district of dry Maharashtra, had as well fallen victim to the 1972 drought and a following economic and social deterioration. Governmental money that came into the village through drought relief and mitigation programs was misused and led to corruption, inner social discrepancies and cleavages. It was only the election of Popatrao Pawar to be the village's sarpanch, in 1989, that changed the situation. Pawar is a native of Hivre Bazar who was sent outside of the village for the purpose of education by his parents, however kept visiting his birthplace regularly. After being requested by desperate villagers to stand for the gram panchayat elections, Pawar accepted, but claimed to renounce his post if, after six months, the differences within the community would not be abolished. (Menon et al. 2007)

Popatrao Pawar started with addressing the main problems by installing new hand pumps to provide drinking water and by changing the school structure and appointing new teachers. The main concern for all villagers was the water scarcity and low agricultural productivity however. From the early 1990s onwards, Pawar was increasingly inspired by the watershed and community development in Ralegan Siddhi, so that he took villagers to see Ralegan Siddhi and show them what could be possible through a collective effort. He approached the Indo-German Watershed Programme that was active in some neighbouring villages to get financial assistance, which however was refused due to Hivre Bazar's bad reputation. In 1993, the Social Forestry Department of Ahmednagar district came to help by financing the treatment of seventy hectares of forest land with 40,000 contour trenches and tree plantations. The ban on grazing was introduced and the gram
sabha decided on regulations for the fodder provision. After the first monsoon, the effects of the watershed development could be seen by the water available in the wells which increased the irrigation area from 20 to 70 ha. (Menon et al. 2007)

In the early 1990s, inspired by the progress in Ralegan Siddhi, the government of Maharashtra started a program called the Adarsh Gaon Yojana (AGY, Ideal Village Scheme). The idea was to replicate the Ralegan Siddhi success, Anna Hazare became the president of the AGY and Hivre Bazar was among the 300 villages chosen to receive the government's support in the process. The precondition for the project implementation in the villages was, however, a visible commitment within the community to bring about a change. Thus, they first had to prove that they were ready to follow the collective rules of ban on grazing, tree felling as well as delivering shramdaan to get involved in the community development projects. In Hivre Bazar, this was, by the preceding activities under the leadership of Popatrao Pawar, accomplished. Unique about the AGY was that it consisted of “a government attempt to support a community-led and NGO-assisted development with community participation before it had been mainstreamed within official guidelines elsewhere” (Menon et al. 2007, p. 31).

Under the AGY, which started in 1994-95 and ended in 2003, Pawar's main task was to organise the villagers collectively to do the necessary physical work for water harvesting and conservation. Discussing the projects in the gram sabha, the villagers decided to create an NGO, the Yashwant Agriculture, Village and Watershed Development Trust, which would enable themselves to plan and implement the projects on their own, instead of bringing in an outside NGO for assistance. Soil and water conservation works were implemented on common lands and private waste- or grasslands, contour trenches were dug along the slopes, nala bunds, check dams, percolation tanks and loose boulder structures were all constructed in the village, along with many tree plantations on forest lands and on the roadsides. Other rules, such as the ban on using bore wells for irrigation, the cultivation of sugar cane and bananas or the selling of one's land to outsiders, were introduced to guarantee the long-term sustainability of the measures and to serve as instruments of community building, as more and more people identified with the common purpose behind the new institutions. (Menon et al. 2007)

What Hivre Bazar has achieved is to rise from being a degenerated, divided village to a village with a collective identity – being an adarsh gaon, an ideal village. The ban on selling agricultural lands to outsiders has rendered a rapid capitalisation of agriculture impossible and the equitable
management of common resources, mainly water, as well as different sharing arrangements between rich and poor farmers ensured that all community members would in some way or another benefit from the actual measures. Through the combination of development, social reforms and a change in personal behaviour, the villagers of Hivre Bazar, just as much as those of Ralegan Siddhi, were able to transcend caste and other social barriers and discrepancies to become a unified community visited by many researchers, politicians, social scientists and technicians. The turnaround of the situation was, like in Ralegan Siddhi, possible through a political conscious and benevolent leadership.

In the same way, another 75 villages in ten districts of dry Maharashtra were personally visited and inspected by Anna Hazare by 2003, and cleared to be turned into sustainable village communities as well. The activities in these selected villages are guided and managed by 29 NGOs. (Hazare 2003) The AGY follows the aim of enabling these villages to become self-sufficient and self-reliant. After a period of community organisation and awareness creation, villagers should be enabled to implement the right measures that will sustainably provide the village with drinking water, employment, green fodder, education and health. They all have to follow the five principles of ban on free grazing and tree cutting, ban on liquor, family planning and shramdaan. The selected villages are all located in drought-prone areas and have shortage of drinking water as their major problem. (Phand and Arya 2007)

The question arises whether these villages, most of them organised by outside NGOs, will be able to bring about the same leadership as Ralegan Siddhi has through Anna Hazare or Hivre Bazar has through Popatrao Pawar and if what starts in simply being a participatory development scheme can end up in creating self-reliant communities. For this reason, Anna Hazare has requested 4,000 young men to give up their jobs and take on integrated village development. 400 of them showed up, 110 were chosen for the leadership training by the Hind Swaraj Trust in Ralegan Siddhi, where they had to commit to a 5 am to 10 pm task of education and village work such as street and toilet cleaning and living a simple village life. The 75 that remained, willing to commit to the working conditions, among them three Muslims and five women, have moved into their villages to prepare action plans and get the development work started. (Hazare 2003) Anna Hazare explains in his book that “[even] if laws to transfer power to the Gram Sabha are passed now, it will take time to put them into effect. People are ignorant about the powers of the gram sabha. They will have to be educated and made aware about it.” (p. 46) He further notes that “if there is an awakening of the people through general education, and if people step forward to do good work and face challenges,
then there is a possibility of moving towards having a strong and sound democracy.” (p. 47) Ralegan Siddhi is the living example for this idealistic statements.

5.3.3. Mainstreaming community-based natural resource management

The success of integrated watershed management in India not only made the Indian government design plans and programs for a scaling up of the first best-practice examples, but also international donors and lending agencies like the World Bank started investing huge amounts of money into what they commercially call community-based natural resource management. Over a period from 1992 to 2000, the World Bank alone has lent US$ 460 million for forestry projects in India. (Menon et al. 2007)

The question, however, arises whether the mainstreaming of the development practice leads to, how Elinor Ostrom has called it, the dilemma of the “blueprint approach”, where outside development agencies tend to propose a single solution for various problems and situations. Affected populations will probably not be able to control their own development and gain ownership over their resources. Inadequate solutions will not improve their situation. Therefore, the involvement of local NGOs into the process, education, the raising of awareness and the building up of leadership on the village level will be of major importance.

6. Conclusion

It is clear that the model of Ralegan Siddhi has been, since the arrival of Anna Hazare, a successful example of sustainable participatory village development. While different governmental schemes failed to substantially improve the desperate situation of the villagers, it was only Anna Hazare’s integral approach dealing with the role of the individual and the individual's place within the community and interconnection to the environment that was able to bring about an essential change. Totally new structures built upon independently managed administrative units were formed and enabled the villagers to involve themselves in local affairs. These units, however, complement one another on a grass root level of governance, where intercommunication and interactions with the local community are more easily executed and coordinated. The empowerment of the local communities to govern themselves has reinstalled human dignity amongst the villagers, self-confidence and a feeling of belonging and ownership.
In the *Journal of Rural Development* Shahaji Phand and H.P.S. Arya (nd) note that “drought and poverty will not subside by giving temporary help to the villagers, but the local community initiatives within the purview of 'Panchayat Raj System' is the most promising approach”. It is through the successful implementation of the Panchayati Raj System through a systematic empowerment of the local population that Ralegan Siddhi’s political relevance on the national as well as the global scale becomes most obvious. The change that took place at the grass root level left an impact on the higher bodies of governance on the State and national level and the villagers implemented national policy prescriptions by themselves. Anna Hazare (2003) remarks that “[national] issues like overpopulation, environmental pollution, unemployment, fuel shortage etc. should be dealt with at the village level” (p. 15), as it is on the village level where the direct contact with these issues takes place. However, he clarifies that “[...] with different geographical, social and economic conditions prevailing in various states, programmes identical with those of Ralegan Siddhi could not always be implemented. They would have to be modified according to the specific requirements of the other regions.” (p. Nine)

As Elinor Ostrom suggests, diverse ecological, social and economic settings require a diversity of institutions. The involvement of the villagers living in these settings was the reason the people of Ralegan Siddhi were able to build up a situation that fits their own needs and possibilities, respecting the vulnerabilities of the different social groups and the environment. The integration of every village member into the decision making process and the transparency of the local system created through the regular community meetings have brought about a situation where social norms such as reciprocity, trust and fairness could evolve. It was not a central authority, but rather a change in collective action and behaviour that proved capable of installing a sustainable natural resource management system in the village. The eight design principles that, according to Elinor Ostrom, characterise robust natural resource management systems apply to the institutional body of Ralegan Siddhi, so that her method finds acknowledgement in this study.

It is not predictable, however, how the village will continue after their leader, Anna Hazare, will have left. But even if his departure could be a threat to the village's sustainability and self-governance, it is appropriate to put Ralegan Siddhi's achievements in a wider context and recognise their relevance at the national level - or even globally. Even though politicians and scholars seem to have a preference for uncomplicated, simple structured authority systems, the transformation of Ralegan Siddhi confirms Elinor Ostroms (2005) proposition: “Now that we know that those dependent on these resources are not forever trapped in situations that will only get worse over
time, we need to recognize that governance is frequently an adaptive process involving multiple actors at diverse levels.” (p. 286) The commitment of Ralegan Siddhi’s inhabitants to build a better community and their determination to self-governance and self-reliance have influenced Indian public policy makers to delegate more decision making power to the local level. It is here, in the Ralegan Siddhi of the last 35 years, that Mahatma Gandhi’s vision of an India organised in self-governing village republics is revitalised and that true democracy, in which the voter occupies the highest place, finds fulfilment. Or, as Anna Hazare (2003) explains, “if there is an awakening of the people through general education, and if people step forward to do good work and face challenges, then there is a possibility of moving towards having a strong and sound democracy” (p. 47).
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Table 1, p. 45: “Impact of watershed development, key indicators”, from Government of Maharashtra (GOM), nd, “Ralegan Siddhi Watershed Development Programme”, Departments of Jal Sandharan, Mumbai, India.

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Figure 3, p. 44: “Agricultural diversity”, photo by Michel Thill in Ralegan Siddhi, Maharashtra, India, 2010.

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Eidesstattliche Erklärung

Hiermit erkläre ich an Eides statt, dass ich die vorliegende Diplomarbeit

“Sustainable development and natural resource management
through community participation in Maharashtra, India:
the case of Ralegan Siddhi”

selbstständig und ohne fremde Hilfe angefertigt habe. Ich habe dabei
nur die in der Arbeit angegebenen Quellen und Hilfsmittel benutzt.

Berlin, den 7. März 2011

Michel Thill