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Towards Sustainability: Environmental Education in China - A German Strategy for Chinese Schools?

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Towards Sustainability: Environmental Education in China
A German Strategy for Chinese Schools?

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Towards Sustainability: Environmental Education in China
Can a German strategy adapt to Chinese schools?

May – October 2004
Beijing, People's Republic of China

A project of the Asia-Pacific Economic Research Institute (FIP)

Sponsored by the Tamaki Foundation, Seattle, USA

Project manager: **Prof. Dr. Günter Heiduk**

Project implementation: **Caterina Wasmer, MA**

In the last years China has recognized the environment as an economically valuable good, thus promoting sustainable economic development. Among the young people, this principle is spread by creating awareness through Environmental Education (EE) in schools. Although high on the agenda, the implementation of EE is restricted by a lack of finance and know-how so that Chinese schools benefit from foreign assistance. The focus of this paper is to evaluate the situation of EE in Chinese schools and to test the adaptability of a German EE strategy in China.
For this purpose, the need patterns of different categories of schools concerning the contents and the implementation of EE are analyzed. These need patterns are then contrasted with the contents and concept of the German EE strategy. The restrictions in adaptability as well as the necessary adaptations of the German strategy are concluded and laid down accordingly. Together with an outline of possible project partners, these findings are put together to form four different project proposals for EE projects in Chinese schools.

Keywords/ Schlagwörter

Sustainability, China, Environmental Education, Feasibility Study

Author

The author has completed a Master of Arts in Sinology, Public Law and Political Science at Würzburg University from 1996 - 2002. After gaining practical experience in different fields, she joined the MBA-program of the European School of Business, University of Applied Science, Reutlingen. She graduated in February 2005.

PREFACE

As a result of the United Nations Summit on Sustainable Development in Johannesburg 2002, the Tamaki Foundation, Seattle WA, USA initiated a research project dealing in the first part with the 'Environmental Policy and Law in Germany, USA and Japan: The Struggle for Equity', in the second part with 'Sustainable Growth and Environmental Protection: The Case of China'. The University of Duisburg-Essen was in charge of the second part of the project, cooperating with colleagues of the University of Maryland and the Woodrow Wilson Center, Washington DC. The scientific results of the project were discussed with representatives of different ministries in round table meetings both in Washington DC and in Berlin. The participants agreed that increasing efforts have to be put into the development of new concepts for environmental education.

Therefore, the Tamaki Foundation decided at the beginning of 2004 to further support

- a pilot project in Germany aiming at the implementation of new methods of environmental education in schools, and
- a feasibility study on environmental education in China.

The latter project was kicked off in February 2004 with preparatory meetings at several ministries and institutions in Germany.
The field study was carried out by Ms. Caterina Wasmer, MA between May and October 2004 in Beijing. Ms. Wasmer has kindly been invited to China by Prof. SONG Xinning of Renmin University, Beijing.
The study has mostly been conducted by the means of literature study and interviews with experts. It lines out the evolution of environmental education, its role in the educational system as well as the actors in the field. An analysis of the needs of Chinese schools and the feasibility of adapting German strategies to Chinese environmental education follow. Outlines for possible projects in environmental education in China complete the study.

The final report was submitted as a Master Thesis at the European School of Business (ESB), Reutlingen, Germany to obtain the title 'MBA in International Marketing'.

It is well known that China's scientific culture is different from the western traditions. Especially the access to specific knowledge and decision-makers runs along different lines than in Europe or the USA. Taking this – and the short time of preparation – into account, Ms. Wasmer has achieved impressive results. The study has been awarded the best possible grade.

It goes without saying that we want to thank all supporters, especially Prof. Dr. Jörn Altmann of ESB Reutlingen for his supervision, the CIM experts of CESDRRC, Beijing, Dr. Eva Sternfeld and Ms. Tanja Ploetz and Prof. HUANG Yu of Beijing Normal University, Beijing as well as all those who have supported us with advice and information.

Last but not least we gratefully acknowledge the support of the Tamaki Foundation, not only in terms of finance but also in terms of promoting the importance of environmental education for a sustainable development in China and all over the world.

Günter Heiduk

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Executive Summary

At present, the state of Environmental Education (EE) in China is inhomogeneous. Among schools situated in different geographical areas, the implementation of EE and the quality of teaching vary considerably.

It is basically possible to adapt an innovative EE strategy from Germany[1] for a group of Chinese city-schools. They seem to fulfill the preconditions that are necessary for the implementation of this strategy. The state of EE in the larger group of schools (city-near and countryside/remote area schools) does not allow for an adapted strategy, but demands a special project design tailored to their needs.

1. Purpose and scope of the paper.

The general purpose of this paper is to provide funding and implementing institutions in donor countries with the information on how, where and why to implement what kind of project on EE in China.

To impart this knowledge the document has the following scope. It contains:

- Basic background knowledge on the development, the institutionalization and the implementation of EE in general.
- An outline of what is done and what still needs to be done in the field of EE.
- A derivation of the needs of Chinese schools taken from the development, the characteristics and the deficits of EE in their geographical location.
- An evaluation of the possibility to adapt the concept and the content of the German EE strategy to China.
- A description of alternative project settings, their approximate time and cost frames, as well as possible project partners for the implementation.

2. Methods.

The information given in the paper has been obtained through the study of the relevant Chinese and international publications in the field. To obtain an insight into the implementation of EE in schools experts of EE have been interviewed.

[1] This strategy is the main part of the Tamaki Foundation Environmental Education Project. Its introduction in Germany is planned for 2005.

3. Results.
    - The situation of EE in China is very different from that in Germany concerning its institutionalization (educational system) as well as the implementation (teaching).
    - The implementation, the level and the understanding of EE vary greatly between schools.
    - The variances in EE are mostly due to the geographical situation of the schools. Accordingly, schools can be separated into categories that reflect their geographical location (city, city-near, remote/ poor areas).
    - Each category of schools faces its specific challenges and needs in EE.
    - There is a lack of knowledge on teaching methods in EE in most of the Chinese schools looked into.
    - There is a need for teaching materials on EE especially for non-city areas.
    - The German project can only be adapted to fit a fraction of Chinese schools, namely those with a level of EE comparable to the German. They are located in certain cities.
    - In China a project reaches a long-term effect if it works along networks instead of going through administrative or institutional channels.

4. Conclusions.

The large regional/local differences in quality and performance of EE cause different need patters that demand specific project settings for the categories of city-, city-near- and countryside/remote area schools. It is only possible to implement the adapted German project in city schools with a standard similar to German schools. The structures and resources for this kind of project exist there already. The implementation can run smoothly along established structures but demands a comparatively higher financial commitment. Knowledge on global environmental issues can be spread that way.

For schools in the city-near to remote/ poor areas it is necessary to promote the basics of EE. Most of the schools lack the structures as well as the resources to implement EE on the level of the German strategy. Existing structures need to be reinforced and resources have to be strengthened. The implementation of projects in remote areas will demand more time than those in cities. Any project in schools of these types will create an immediate impact on their quality of EE.

All the above-mentioned projects should include teacher training, especially those implemented in non-city areas. It is furthermore important to write up material on EE for non-city area schools.

Generally, an optimal dissemination of EE can be reached by project settings that take into account the specifics of the Chinese mentality and the political and educational system. For the implementation of projects, a Chinese partner with a good network is needed to guarantee effectiveness and long-term effects. Concerning the geographical reach of a project, it will start from a limited number of schools in the chosen area and then spread to schools with similar need patterns later on.

5. Recommendations.

According to the preferences and scope of engagement of foreign donor/ implementing institutions, one of the project settings proposed in the paper will be chosen. For the implementation of the project, the following actions are recommended:

- **Draw up a project proposal in English and Chinese for the project.** It is important to draw up a bilingual version that is distributed to potential project partners. The Chinese version will help to prevent uncertainty or misunderstandings.
- **Choose a coordinator and main partner with a good reputation from among the suggested possible project partners.** It is important to have a Chinese partner who knows the field and the actors within it, namely has a good network. This partner will ensure the quality of contents and the keeping to schedule through his experience in working together and coordinating Chinese institutions/ organizations.
- **Work together with this partner who helps to choose further project partners and the target schools.** This will help to build up a network of partners that already know each other and work together smoothly. From among the numerous schools the coordinator can help identify a group of target schools.
- **Get in personal contact with the partners.** To set up a personal contact to potential partners is an important means to understand their idea on the project and to heighten their commitment to contribute. In China, personal relationship ensures in most cases that everything runs smoothly and quickly and issues are solved more easily.

1. Introduction

China is one of the world's largest countries. It covers nearly 10 million square kilometers and spans three climate zones reaching from the desert plains of the Northwest to the beaches of Hainan Island and the Himalaya. Beside the central capital Beijing there are 23 provinces, 5 independent regions and several independent cities. Out of its more than 1.2 bn inhabitants, more than 80 % still live in the countryside. Because their living standard is mostly rather low, land-drought and environmental degradation is a serious problem. In recent years, uncontrolled exploitation of resources and uncoordinated economic development cause enormous environmental and social problems.

The Chinese economy will undoubtedly continue to grow and further spread the economic development from the cities to the countryside. It is of utter importance for the future economic and social stability of the country that this development is sustainable. Among the many ways to ensure economic sustainability, the creation of awareness for environmental matters is one method.

To foster the environmental awareness within the whole Chinese society is an urgent task. During this process of awareness-creation the younger generation, the decision-makers of tomorrow, deserve special attention. One possible access to children and young adults is through schools. Through running projects on EE in schools the environmental awareness and the environmental behavior of the students might be improved.[2]

1.1. Goal-setting and approach

This study describes how, where and why to implement a project on EE in Chinese schools. It furthermore discusses the possibilities to adapt an innovative German project on practical environmental classes that is planned to start off in 2005, to China.

The first step to evaluate the feasibility of implementing a project on EE is to analyze the general conditions of EE in China. The general conditions for a project are factors, which generally determine the project's contents, methods and its implementation. These factors can be geography, mentality and administration (political and educational). It is important to recognize and take into account the differences and peculiarities that

[2] Wang Min has shown in his PhD thesis that EE influences the environmental awareness and the environmental behavior of school children. (Wang Min (1998)).

evolve from these. Besides these factors, the feasibility of a project also depends on how well it fits to the needs of its object. The needs can be found out in a needs analysis. For a needs analysis appropriate categories are set up first. By contrasting the should- with the is-situation, the needs of each category are found. From the above-mentioned factors and the needs analysis the necessary adaptations in content, method and implementation of the German project are derived. The adapted project outlines are discussed and possible partners for the implementation are pointed out.

1.2. A short description of contents

Each project that is implemented in the area of EE has to take into account the specific Chinese conditions determined by the political and educational system, the mentality and geographical factors. These are reflected in the set up of the educational system, the understanding of EE and its implementation.

A short description of the Chinese educational system, the development and the understanding of EE and its position in the curricula give an overview over the current state of EE in China.

The description of the development and the integration of EE into the curricula lines out the goals or the ‚should-situation' for EE in Chinese schools. A screening of the description of the 'is-situation' in schools reveals that their common grounds result mostly from a similar geographic location. Accordingly, three categories of city-schools, city-near schools and remote/ poor area schools are established. Then an analysis of the should/ is-situation (needs analysis) determines the different needs of the schools. It shows that in city-schools EE is already well developed. There are 'gaps'/ deficits in the implementation of EE that could be filled with an adapted German EE strategy project.

In the categories of non-city schools, the needs analysis shows that their 'gaps'/ deficits in EE are too extended to fill them will a single project. Here projects that strengthen existing structures should be implemented in the first place.

Because of the need profiles the German project can only be adapted for city-schools with a 'German' level of EE. Non-city schools demand project settings that are tailored to their needs. Therefore, the discussion of the adaptability of the German project is followed by a list of possible project partners for the implementation of projects. The paper concludes with the outlines of projects for city-schools and non-city schools, their timelines and their approximate costs.

2. China's educational system

Around the world the structures of educational systems differ. One factor determining these differences is the degree to which the governments intervene into the educational system. On the one extreme there is the highly centralized, controlled system, on the other extreme there is the decentralized, independent education sector. The system normally evolves along with the political and scientific culture. Highly centralized countries tend to have a highly centralized educational system. This is also the case in China, where the political system is highly centralized, too.[3]

Since the economic and administrative reforms in the late 1980s however, there is a tendency to give up parts of this centralism. This was the result of the insight that the generalized principles of the central government could never match the different needs of every single province. In order to improve the quality of educational work, more and more administrative power and responsibilities for the implication of government policies in the educational field has been given to the local authorities.

2.1. Basic education

In China education basically starts with the three- to six- year old children enrolling in kindergartens and preschools. Over 43, 8 % of all children of that age were enrolled in kindergartens and preschools attached to primary schools in 1999.[4] Generally, children enroll in kindergartens at the age of three. They then attend preschool classes one year before they enter primary school at the age of six.

In 1986 the National People's Congress issued the *Compulsory Education Law* stipulating the compulsory education to be nine years. Depending on the regulations of each province, these nine years split up as follows:

1. Six years of primary school, three years of lower secondary school.
2. Five years of primary school, four years of lower secondary school.
3. (Very rare) nine years of primary school.[5]

The graduates of lower secondary schools seeking to continue their education sit for locally arranged upper secondary school entrance exams before admission.[6]

[3] Wang (2003: 24).
[4] CYE Editorial Board (1999: 52).
[5] Ye (1997: 12).
[6] Wang (2003: 136).

Sitting attains the diploma of upper secondary education for the local unified school-leaving examinations. Those students who want to continue their studies in higher education institutions will sit for the nation-wide university entrance examinations.

2.2. Vocational education

Parallel to this 'traditional' way of education there is the possibility to attend vocational training schools starting after primary school. Mostly in rural areas, junior vocational schools offer 3-year programs to their students. They teach lower secondary school knowledge along with the knowledge needed to work for rural township enterprises. They also train farmers and workers.

After graduation from lower secondary vocational schools, students can continue to specialized secondary schools, which train technical and managerial professionals for production facilities. They can also advance to skilled workers' schools or vocational high schools. All of these schools offer programs of 2 to 3 years in length.

There is the possibility to continue to post-secondary vocational training, but this type of school is still rare. Normally, graduates from upper secondary vocational schools join the workforce.

In recent years, the government has encouraged enterprises, businesses, social organizations and private persons to open schools. In some places, there are Chinese-foreign joint venture kindergartens and schools. These schools have to apply for recognition by the government and the administrative body administering them.

2.3. The administrative structure

The *Education Law of the People's Republic of China,* which came into effect on September 1, 1995, is the basis for the allocation of administrative power within the educational system.

The educational administrative system operates according to the principles of:

1. Guidance by the central authority.
2. Responsibility on the local level.
3. Administration on different levels of authorities.[7]

This means the central government is responsible for drawing up the legal decrees, the political and educational guidelines and the national development programs. In short, the central government does the macro planning for primary and secondary education.

[7] Please refer to Figure 1 in the appendix for an outline of the administration of education in China.

This macro planning also includes the laying-down of the school system, the fixation of subjects and the financial support of remote and/ or poor areas. Since 1993 the central government has begun to implement the unified *Teaching Scheme (Curriculum) for Fulltime Primary and Secondary Schools*. This *Teaching Scheme* divides the subjects in the two categories of state-arranged and locally arranged subjects.

The implementation and the drawing-up of the detailed contents of primary and secondary education are the responsibility of the local governments. The local governments:

1. Set up the development plans for compulsory education.
2. Decide on the locally arranged subjects.
3. Choose the contents of classes.
4. Approve and stipulate the teaching materials within their province.[8]

On the county level again, the governments are to implement and plan the regulations issued by the provincial government. The government on municipal level administers educational funds, employs headmasters and teachers and supervises the realization of the compulsory education.[9]

The result of this hierarchical administration is that several layers of administration administer a single school. Every layer of administration itself is responsible of another aspect of education within that school. For the realization of reforms or projects this means that additional time and costs to obtain the approval of all these authorities have to be included in the planning.

Like primary and secondary education, the governments of provinces, municipalities, and counties jointly administer vocational education.

In contrast to that, higher education is administered by only two levels of government- the central government and either the governments of provinces, or municipalities or autonomous regions. The latter depends on where the university is located.

There are also universities directly administered by the Ministry of Education. Those are the key comprehensive universities located in major Chinese cities. Furthermore there are universities belonging to other central ministries. These universities are

[8] The final approval of the teaching materials is centralized to guarantee a homogenous level all over the country. The Committee for the Approval of Teaching Materials is responsible for the approval. The local government can only allow the respective books to be sold and used within local schools after having attained approval from this committee. (Wang (2003: 51).

[9] Su (2002: 40, 41).

specialized in the field of the ministry they belong to.[10] One level below the central ministries, the national bureaus of each industry also administer their own universities.[11]

Again, the central government organs are responsible for issuing guidelines and regulations. The respective lower level authority is then responsible for the implementation of the guidelines.[12]

The short outline of the Chinese educational system already gives a hint to the complexity of the whole administrative system. It is not only highly hierarchical but responsibilities are also allocated at several different levels of administration. Regional and economical differences further add to this complexity.

According to region and economic situation, the implementation of central government policies meets different administrative structures and mentalities. Where on the surface structures appear to be identical, it is still possible that in reality things work along very different lines. This feature makes it particularly hard to implement anything on a national level with equal outcome and common standards.

3. Economic development and Environmental Education

"Development is a form of change in social processes and institutions broadening the set of options that people have to improve their livelihoods and determine their future."[13]

China's economic development in recent years was initiated by Deng Xiaoping's reforms in the late 1980s. Since the reforms, through rapid change in social and economical aspects, China's economy has constantly grown at a pace of 7 to 8 percent per year. The impact both on society and on the environment is tremendous.

Up to date, both the economic and social change have been achieved without much thought about the principle of sustainability.

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[10] For example, the Ministry of Agriculture finances, guides and directly administers the China Agricultural University and the Hebei Agriculture University. There are approximately 200 universities like that. (Wang (2003: 149, 150)).

[11] The Beijing Institute of Broadcasting, which is administered by the National Bureau of Radio, Film and Television in Beijing, might serve as an example.

[12] This description is heavily simplified due to the fact, that the administrative system is not the main focus of this paper. In reality, there are even more layers of government and administrative organs involved. The area of vocational training is an exception in this regard. Its administrational system is rather flexible and non-hierarchical.
For further detail on the educational system refer to Wang (2003).

[13] UN Development Program (1995: 125).

The Brundtland Report published in 1987 first pointed out the concept of sustainability with its emphasis on the need to maintain resources for future generations.[14] All economic activities imply using natural and human resources. According to the way of using natural resources we distinguish between sustainable and non-sustainable economic activities. In this respect, China, with its fast developing economy and ever higher need for energy has a huge responsibility, both towards its people and towards the rest of the world. In the course of the increasing international integration of the country, the Chinese government has accepted this responsibility. Although the government has taken steps to protect the environment and the resources the Chinese people generally seem not to have realized the global importance of a sustainable China.

3.1. The Chinese approach to sustainability

In its environmental dimension sustainability is defined as "a process of change in which the exploitation of resources, the direction of investment and the orientation of technological development (…) are all compatible and satisfy current human needs and aspirations without jeopardizing the future potential to satisfy these needs."[15]

The first step towards sustainability has to be a process of cognition within society and among the political leaders of a country. In most countries, this is a process initiated by the political leaders or through international conventions. This is also the case in China, where the political leaders introduced the principle of sustainability. To illustrate China's approach to sustainability, the following questions will be briefly discussed below:

1. How have policies and cognition towards environmental problems changed in China?
2. How far is the public awareness developed for environmental problems and sustainable approaches?
3. What is the policy of the Chinese government towards public awareness?

Up to the time of the Stockholm Conference in 1972, environmental problems were considered by the Chinese government to be a phenomenon of capitalism. Only by the time that the delegation was back from the conference it was noted that the Chinese

[14] Opschoor, Nijkamp (1999: XIV).
[15] Opschoor, Nijkamp (1999: Introduction).

environmental problems where not only there, but also rather severe and much worse than expected. After this wake-up call, the Chinese government's policies underwent the phases of 'focusing on pollution treatment' and 'protection of the environment'. In 1992 the principle of 'sustainable development' was finally incorporated into the governments' policies.

Along with this process a system of laws and regulations was drawn-up and enacted. In 1998, Wen Jiabao, at that time Vice-Premier of the State Council, eventually advanced five policies on environmental protection. Among them the most important policy was to connect economical development to environmental protection. It states that the economy should develop in harmony with the environment.

Still, economic development officially ranks first, according to the principle of 'development with the help of science and technology' put forward by Jiang Zemin. "The progress of science and technology is the basic way to solve the problems on environment and development."[16] Like that economic development not only ranks first, but the principles of sustainability are hardly applied at all. Sustainability is still considered to be an obstacle by many businessmen, not a promoter of economic growth.

The approach of 'economic development first' is reflected also in the so-called 'Environmental Kuznet Curve' or 'Environmental Transition Theory'. The theory basically states that the relationship between economic development and environmental impact could be represented by an inverted U: starting from low levels of development (that is low per capita income), environmental pressure would rise with income growth, then decrease and level off at high income levels. This implies that with growing wealth a society could spend increasing sums of money for the conservation of the environment. Unfortunately, this theory does not take into account that during the process of development, irreversible ecological damage could be accumulated.[17] So although the environmental pressure would eventually level off, the persistent, former pollution would still cause considerable costs and problems.

3.2. The development of environmental awareness

It is now of interest to know if the approach of 'economic development first' has had an impact on the public awareness towards environmental protection. A short look will be

[16] The BNU-Gakugei Research Group (2002: 72).
[17] Opschoor, Nijkamp (1999: XXVIII).

taken at the state of awareness for environmental issues and environmental behavior in China. In his thesis 'A Study on the Environmental Awareness of Primary School Students' Wang Min examines the interrelation of environmental knowledge, environmental awareness (EA) and environmental behavior (EB) of school children.[18]

The study states that mostly family, school and society influence EA. Through the statistical analysis of questionnaires the author points out that primary school students are influenced by all three factors, while in secondary school the influence of parents and society declines. For secondary school students, the school influences their EA and EB most. The EA of girls at all levels is higher than that of boys. The behavior and the education of the parents play a crucial role for the development of EA.

Concerning the interdependency between economic development and environmental awareness a surprising point has been found. By testing the dependencies between EA, EB and the income of the parents it could be proved what other studies suggested earlier: There is a clear tendency that the EA of the children is declining the higher the income of the parents is.[19]

This is an important point, which could prove the Environmental Kuznet Curve to turn out in its contrary in the end. According to environmental experts, there is an increasing tendency among the well-off Chinese to think about the environment as something that money can buy.

As a result of his thesis, the author could prove that environmental education is the important factor that forms the EA and EB of students.[20] He therefore recommends national action programs to boost environmental education in schools, in public and among parents.[21]

The Chinese government has realized the urgent need to educate its citizens. As a result of the First National Conference on Environmental Education in 1992 the guideline 'to protect the environment, education is fundamental' has been put forward. In 1996, the State Environmental Protection Administration (SEPA), the Central Propaganda Ministry of the Chinese Communist Party and the State Education Commission issued the *National Action Compendium on Environmental Propaganda and Education (1996-*

[18] This study has been chosen, because the focus of a later project will be on educating school children and young adults.
[19] Wang Min (1998: 159).
[20] Wang Min (1998:180).
[21] Wang Min (1998: 202).

2010).[22] By doing so, the Chinese government set a clear signal that environmental education is one of the strategic measures to implement sustainable development.

3.3. A Definition of Environmental Education

In western countries Environmental Education (EE) is defined as "educating the students to help them develop a 'feeling of esteem' towards the environment as well as to learn the appropriate 'environmentally friendly' behavior".[23]

In contrast to the western countries, EE in China was first seen as a means to spread knowledge on environmental science among officials and among personnel in technical areas. Only at the beginning of the nineties did the Chinese government realize that to raise the environmental awareness of every single citizen was crucial.[24] So, on the one hand, the term EE was used for spreading the newest findings in environmental science by the use of mass media (= propaganda EE) and on the other hand, EE was also referred to as educating students on environmental matters (= pedagogical EE).[25]

In 1995, the Chinese government finally pointed out that:

"EE is the basic method to raise the quality of moral thinking and of scientific education (including environmental awareness). EE comprises the knowledge of environmental science, environmental law and knowledge of environmental morality. EE is education towards all citizens, including all layers of society, all schools and all professionals (…). Environmental education is an important task of all levels of environmental protection bodies, propaganda bodies and educational bodies."[26]

From this rather broad definition, the Chinese government derived the goals of EE in China.

3.4. The goals of Environmental Education

The Chinese government has laid down the goals of EE in the *National Action Compendium on Environmental Propaganda and Education (1996-2010).* According to this compendium, the goal of EE is:

1. To improve the quality of mentality and morality of the whole nation.

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[22] The BNU-Gakugei Research Group (2002: 72, 73).
[23] Xu Jialin et al. (1998: 7).
[24] The BNU-Gakugei Research Group (2002: 85).
[25] Propaganda on achievements in environmental science and environmental education were treated as two different areas. That was due to the fact that different ministries were in charge of education and propaganda respectively. (See: The BNU-Gakugei Research Group (2002: 84)).
[26] Huang, *Environmental Education* 2 (2003), p. 14-15.

2. To improve the quality of science and civilization of the whole nation.
3. To organize environmental protection, propaganda and education at all levels.
4. Mostly determined by the educational system, while cooperating with the system of environmental protection.
5. To adopt to the local needs of regions and their schools in order to make it a valuable part of 'quality education'.[27]

As can easily be seen, the Chinese government understands EE to be applied to all citizens, no matter how old they are. On the other hand, it gives detailed directions on how EE has to be implemented in schools. So here the EE concerned with mass media and the EE concerned with pedagogic matters are mentioned together. This paper will concentrate on the pedagogical EE in the educational system only.

3.5. The development of Environmental Education

In order to judge on the development and also on the shortcomings of EE in China it has to be seen in its historical context. To line out the historical development of EE as well as the changes in concept will help to understand the present situation and its specific challenges.

China's EE and the progress in environmental protection cannot be discussed separately. Both originated at the same time, developed together and advanced each other. The history of environmental protection and EE in China went through the following three phases.[28]

3.5.1. First Phase: 1972-1983

Following the Stockholm Conference and the First National Meeting on Environmental Protection in Beijing in 1973, special emphasis was laid on educating the public about the tremendous environmental problems in China.

In 1981 the State Council issued a paper *The Decisions on Enhancing Environmental Protection Work at Present Time* that became the basis for environmental education. Following nation-wide propaganda activities to educate the public and the foundation of a publishing house for environmental affairs in 1980, environmental science

[27] The term ‚quality education' refers to a new method of teaching, which encourages the overall moral and personal development of the child in contrast to the traditional approach of 'feeding knowledge' and learning by heart. (Su (2002: 52); (SEPA, MoE, Propaganda Dept. of CCP (1996: 435-450)).
[28] The BNU-Gakugei Research Group (2002: 81).

departments were set up at 30 universities and colleges. In 1981 a training school for officials and in-service people was set up in Qinhuangdao.

During this phase first efforts were made to include environmental protection in the curricula of primary and secondary schools: In the beginning of the 1980s two pilot schools in Beijing and Guangzhou implemented these propositions. Generally speaking, during the first phase the need for EE in schools had been recognized but was hardly ever put into practice.

3.5.2. Second Phase: 1983-1992

The second phase was marked by a broader approach to EE. Environmental protection was institutionalized and the focus was laid on improving the environmental awareness of citizens and officials. In contrast to the first phase, the focus changed from environmental science to a more pedagogical approach. Conferences on EE in primary and secondary schools took place and in 1987 EE was officially included in the nine-year compulsory education plan. In 1988 the State Environmental Protection Agency (SEPA) was established. Its Center for Environmental Education and Communication of SEPA (CEEC) became the leader and coordinator in the field of EE. Several conferences about the implementation of EE in schools and universities further promoted its development. In 1990 the State Education Commission called for EE to be integrated as an optional subject in higher secondary schools.

3.5.3. Third Phase: 1992-today

In the third phase EE was officially integrated in economic and social contents.[29] After the UN conference in Rio de Janeiro in 1992, the Ministry of Education (MoE) and the SEPA jointly held the First National Meeting for Environmental Education and indicated EE as a basis of environmental protection.[30] Since 1993 MoE and SEPA hold training workshops for teachers. In autumn 1993 EE was integrated in the new curriculum guidelines. In 1994 the State Council approved China's *Agenda 21*, which considers EE a way to improve sustainability. This marked the beginning of the connection between environmental protection, educational reform and socio-economic reform. As a result, SEPA, the MoE and the Propaganda Department of the Chinese

[29] The integration refers to incorporating EE in laws etc, while the implementation of these still remains incomplete.

[30] The BNU-Gakugei Research Group (2002: 83).

Communist Party (CCP) drew up the *National Action Guideline for Environmental Propaganda and Education (1996-2010).*[31]

Since then, numerous projects and initiatives on EE have been implemented in schools. Several nation-wide programs on teacher training and improvement of EE are running. Still, as the government is not willing to invest huge amounts, foreign companies and foundations finance the larger part of these projects. Considering the support the Chinese government is giving to NGOs and other organizations promoting EE, there is hope that in the future EE will spread more widely.

3.6. Foreign influences on EE in China

Seeing the large number of foreign companies and institutions sponsoring Chinese EE, the question of their influence can be raised. Does their engagement provoke any changes in any aspect of Chinese EE?

Basically, it can be said that although foreigners donate money and run projects, the direct foreign influence on Chinese EE is not very pronounced. Projects mostly intend to strengthen existing Chinese structures instead of creating new ones according to foreign models. There is a certain amount of indirect influence on the perception of EE and its pedagogical methods in China: most of the initial teacher training, teaching materials and information on environmental issues come from abroad. There is a considerable influence on teachers through the lectures and workshops given by foreign experts. Nevertheless, this influence is limited to the application of EE. On the 'official' side concerning regulations or law-making, foreign influence is present but not very large either. Occasionally, some foreign law (e.g. the German Law on Renewable Energies) is an orientation for the Chinese laws in the field. On the pedagogical side there is no clear foreign influence discernible.

4. Environmental Education in the educational system

According to the general understanding of EE by the Chinese government, EE should basically be present in all educational institutions. Theoretically it starts off with kindergarten continues into primary and secondary school and is finally taught at vocational schools and universities.

[31] The BNU-Gakugei Research Group (2002: 83); Xu Jialin et al. (1998: 8-13).

Due to several reasons that will be explained in detail below, EE is in fact only practiced in a limited range of these educational institutions.

Nevertheless, as the goal of a future project is to spread EE in the country, it is important to understand the current situation of EE in the curricula, its contents, achievements and its shortcomings.

4.1. EE in the curriculum

In March 2000, the MoE issued a new teaching scheme (curriculum) for all subjects for the fulltime nine-year compulsory education and upper secondary education.[32] In 1992 the MoE (at that time: State Education Committee) had changed the curricula to consist no longer only of compulsory subjects but of compulsory subjects and 'activities' (= locally arranged subjects).[33] Furthermore, "because of the wide terrain and populous problem there existed great difference in the development of economy and culture in China. For this fact State Education Committee made the policy of 'one syllabus and many editions' in order to adapt needs of local and school" (sic).[34]

As mentioned earlier, the centralism in education had partly been abolished. The central government encouraged experts and teachers to write up textbooks and the local governments received more responsibility. In 1994, the *General Teaching Outlines for Primary and Junior Middle School (For Trial Use)* lined out that "primary natural science, primary social studies, junior middle subjects of physics, chemistry, biology and geography should emphasize and promote environmental education".[35] As a result, the reformed curriculum issued in 2000 provides time for environmental education causes.

Environmental education courses can be set up in middle schools in the form of integrated practical or selective lessons. The content of these should be environmental issues connected closely to the daily life of the students. These courses provide the time for the implementation of projects.

The year 2000 teaching scheme suggests implementing EE not only just in biology, geography and chemistry but also in the scientific subjects (physics, math) and moral

[32] Wang (2003: 135).
[33] ‚Activities' are courses that are adoptable to regional needs and differences. The respective local education authorities decide on the contents.
[34] The BNU-Gakugei Research Group (2002: 77).
[35] State Education Committee (1994: 21), in: The BNU-Gakugei Research Group (2002: 78).

education.[36] Furthermore, EE should be included in the extra-curriculum activities and region-based or local-based curriculum (= 'activities', locally arranged subjects).[37]

A study undertaken by two researchers in Beijing has shown, that despite that EE is included in the curriculum guidelines and textbooks, only a fraction of the teachers teaches EE in math's, Chinese or moral education.[38]

Nevertheless, in the subjects of geography, biology and chemistry EE has been taught from the beginning of its inclusion in the curriculum. It is considerably easier to connect an EE topic like water pollution to a chemistry lesson than to a language lesson. Therefore, EE has developed very rapidly in the subjects that have close links with environmental topics anyway.

4.2. The contents of EE

It has been pointed out that EE was at its beginnings considered as a means of spreading environmental knowledge to the public. Also in the schools EE started off like that. It consisted or still consists in some schools, out of lectures taught from books. The teacher is talking and the students are listening. The focus is mainly on book-knowledge and learning by heart, which is a traditional approach to learning in Chinese schools.

In recent years some schools regularly organized out-of-classroom-activities. Popular activities include participation in Earth Day festivities, tree planting activities, cleaning up public spaces and collecting used batteries.[39] Generally, EE is taught as a combination of book-knowledge and these activities. Chinese experts in the field criticize this approach because it does not contribute to the creation of awareness. That is due to the fact that the activities are undertaken only once a year at special occasions. The experts opt for regular activities at best those made up by the students themselves. The activities organized by officials or teachers are not sustainable because they lack coherence and follow-up care.[40] This short outline shows that EE still lacks integration into several subjects and the daily life of the students.

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[36] Morals are a subject comparable to Ethics where knowledge on moral behavior and ethical values is taught.

[37] The BNU-Gakugei Research Group (2002: 93).

[38] The BNU-Gakugei Research Group (2002: 98). The subjects of primary and secondary school can be seen from the figure 2 in the appendix.

[39] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 47.

[40] The BNU-Gakugei Research Group (2002:102).

4.3. The achievements of EE

Although the Chinese educational system was reformed in 1996 and 2000 to get away from 'front-teaching' and passive learning by heart, there is still much room for improvement. Interestingly, this process of reform is accelerated by the integration of EE into the curricula. This is very specific for China and runs along the following logic: The official guidelines ask EE to build up the quality of morals and science. So EE is to improve the environmental awareness, the behavior and the feeling of esteem as well as the understanding of the environmental logic.[41]

But with the traditional 'front-teaching' there is no room for building up a personal relationship between teacher and students. Neither is it possible to let the students acquire skills of independent, critical thinking which are crucial for the development of an independent, responsible personality. And only a personality like this is able to behave responsible towards the environment. Like that, the implementation of EE demands a completely new approach to pedagogies. It calls for high quality teachers, different teaching contents, different teaching methods and different teaching attitudes.[42]

Numerous scholars of Chinese Normal (= pedagogic) Universities have recognized the problem. Essays and workshops as well as books suggest new approaches to teaching. These include experiments, small study groups, excursions and role-plays.[43] An NGO suggests to conduct surveys on the environmental awareness of citizens in parks as well as observations in nature.[44] Another book issued by SEPA suggests activities and projects in the field of 'getting close to nature', 'taking care of nature', 'recycling' and 'games' on various topics.[45] Furthermore, there are teacher-training centers established at several universities like at the Beijing Normal University.

4.4. The shortcomings of EE

So why is there still a lack in implementing EE? Where and what are the problems EE encounters in schools?

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[41] Huang, *Environmental Education* 2 (2003), p. 15.
[42] Huang, *Environmental Education* 2 (2003), p. 15.
[43] Palmer (2002: 222, 223).
[44] The Handbook Editing Group of Friends of Nature (2004). Please refer to figure 3 in the appendix for the detailed contents of the book.
[45] Center for Environmental Education Communication (CEEC) of SEPA (1999). For more teaching materials please refer to the appendix.

The current problems of EE in China split up into categories of problems that concern teaching/ teachers, the educational system and the contents.

4.4.1. Issues of EE connected to teaching

What keeps the teachers from implementing EE? Or on the other hand, why do teachers implement EE at all?

The study of the two Beijing researchers [46] points out that only a small number of teachers state they do 'a lot of EE' in class. But most of the teachers teach only a little on environmental issues. For this, they gave the following reasons: (from important to less important):

1. Lack of time.
2. Lack of teaching materials.
3. Lack of recognition from the head of school.
4. Lack of finance.
5. Difficulties with the implementation.[47]

On the other hand it has been found out, that the main reason for teachers to incorporate EE in their teachings is personal interest for the topic. But "personal interest is an unstable, low-level motivation. It can be affected by many an external factor, such as the issue being a social hotspot or a chic topic, or the topic involving more international exchanges [opportunities to travel abroad]."[48]

As a result of this study and interviews conducted at Beijing Normal University it can be concluded that very few teachers teach EE out of the conviction that environmental issues are important. They tend to only follow the minimum requirements of the syllabi. Apart from that, most teachers lack professional environmental knowledge and the knowledge on how to impart knowledge on environmental problems to students of different age.

Obviously, all these aspects can be solved if more pre-job and in-job training for teachers is offered. The problem has been recognized and first steps have been taken. Some Normal Universities offer courses on EE for future teachers. In-job training workshop and training centers have been set up at three Normal Universities in recent years. The CEEC of SEPA also offers this kind of training to interested teachers.

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[46] Wang Min (1998: 159-220).
[47] The BNU-Gakugei Research Group (2002: 99).
[48] The BNU-Gakugei Research Group (2002: 99).

Chinese NGOs are busy in this field and foreign sponsors engage in teacher and headmaster training as well.

4.4.2. EE's issues regarding the educational system and the contents

Within the educational system, EE encounters problems in implication because it lacks official endorsement. The MoE still rejects EE to become a subject of its own, because the students are already overburdened with subjects. As a result, EE is spread across the subjects. Moreover, it is also not relevant for exams, so that it might simply be dropped if the teacher is not personally dedicated to the topic.

Currently, the MoE works on a *Manual on Implementation of Environmental Education in Middle and Primary Schools (For Trial Use)*, which will hopefully upgrade the position of EE in the curriculum.[49]

The contents of EE need to be improved so that they fit the age and ability of the students better. Up to now, it has only been vaguely pointed out in the *Manuals* what the aims of EE in primary and secondary schools are. The *Teaching Outlines* give lists of topics to be taught. Along with that there is an outline of what the students are expected to know about the topic at the end of the year. Nevertheless, contents lack differentiation so that the same topics are treated again in the different levels, varying only in the level of detail. Activities and festivities tend to be the same over the years. Like that "students' interest in environmental issues diminishes with the up going of grades (sic)."[50]

The content of EE and its teaching methods depend greatly on educational reform and new pedagogical approaches. It is in this area that EE can only be advanced in line with the implementation of the educational reform. The Chinese government is putting an effort into this area at the moment. But as the whole system and with it the general perception of knowledge and learning needs to be changed, it is a task that will take time.

Interestingly, values like moral behavior towards others, taking care of nature and improving the society by education in morals are Confucian values. Nearly 2000 years ago, philosophers and law-makers made laws about how to stabilize the relationship between man and nature, forbade catching of young fish or cutting of trees in spring. Unfortunately, the Communist Party has fought against Confucianism since its coming

[49] The BNU-Gakugei Research Group (2002: 123).
[50] The BNU-Gakugei Research Group (2002: 101).

into power. Especially during the Cultural Revolution, Confucian values have been wiped out with force. Still, if China can rediscover and revive its own cultural heritage, a big step towards sustainability can be made.[51]

5. A needs analysis concerning the implementation of EE

Concerning the implementation of EE in China, there are some restrictions that determine the implementation generally. Reaching from the formulation of the legal basics to the implementation, different levels and actors influence the process.

5.1. Restrictions for the implementation of EE

Even before the legal formulation of the principles of EE, a scientific and political process takes place. As a result of the specific political constellation in China the dissemination of facts found in scientific research is subject to political considerations. This leads to the paradox situation, that on the scientific side, e.g. environmental issues are researched on a high level, whereas the knowledge about the results is limited to a small group of people. Scientific results are generally not directly disseminated into public. Facts build opinions, but opinion building is the central aim of the political system and with it of the CCP. Accordingly, in a highly complicated process, scientific results are sorted and discussed in the political system before being disclosed. This of course is only the case if the facts fit the political direction and aims. So the political correctness or acceptability determines the agenda of environmental issues. In the area of environmental issues, an ever-widening range of topics is disclosed seemingly unfiltered in the last few years. According to the aims of the government those are turned into regulations and guidelines on EE and included into the curricula. As a result, the contents of EE are extended but the government controls the range of topics.

A restriction for the implementation of EE is the pronounced hierarchy within the political system or the educational system respectively. The regulations and guidelines issued by the central government are sent together with commentaries to the local government for implementation. The local governments again comment on the regulations and hand them down to the schools at the end of several layers of bureaucracy. The ideal situation (should-situation) that the central government intends to create is therefore influenced by several factors. On the system level, pronounced and

[51] The BNU-Gakugei Research Group (2002: 124, 125).

hardly connected hierarchies make a smooth, undisturbed handing over of regulations impossible. On the spatial level the geographical distances minimize the possibilities of a close working together. They also limit the monitoring of conform interpretation. In this way, the contents of regulations are already deformed until they reach the lowest level in the hierarchy, the schools.

Once a regulation has reached the schools more influencing factors determine the implementation. The way of implementation depends on the mentality of the actors and the equipment of the premises (e.g. technical equipment). On the mentality side, the different interests, motivations and capabilities of the implementers determine the actual situation (is-situation) of EE. It also is subject to technical restrictions. Both mentality-caused and technical restrictions again depend on the actual geographic situation, the local political administration and the resulting financial conditions.

Generally speaking, there are the following basic restrictions for the implementation of EE:

1. The complex hierarchy of the political/ educational system.
2. The geographical extension of the country.
3. The difference in basic situations (mentality, ability, finance).
4. The lack of control concerning the implementation of regulations and laws. All

these restrictions caused by several factors and on a different level result in a very inhomogeneous actual situation of schools and EE accordingly. Concerning the implementation of EE, all these different realities again produce needs that vary considerably depending on geographical and financial conditions.

5.2. The categorization of needs

A need is a discernible or unconscious lack of certain equipment, devices or even non-material things like support or training. In order to find out what the need is one has to contrast the is-situation/ state with the should-situation/ ideal. The distance between these two defines the need. This distance/ need might both be perceived (=discernible) and measurable. It can therefore be easily identified both by the actor and the analyst because there is an evident contrast between the is- and the should- situation. But the distance/ need can also be not yet perceived (=unconscious) and non measurable. Such an unconscious need is hidden to the actor who sees no contrast between the is- and the should-situation. This is either because the is-situation is perceived to comply with the

should-situation or because the should-situation is generally unknown. Like this the actual needs can only be identified and made measurable by an external analysis (contrasting is and should) of the situation/ actions of a school as such.
This paper will analyze the needs that arise during the implementation of EE in different kinds of schools. The result of the needs analysis is a suggestion on how to go about in order to foster EE in Chinese schools.

The should-situation is a derivation of different proposals, guidelines and regulations in the field of EE. At the time of their formulation, the inhomogeneous 'single realities' in China had already been taken into consideration. Like that, the proposals, regulations etc are not only very vague, but even allow for local adaptations. In the extent to which they allow a certain freedom, the derivation of the should-realities is also vague or even not determinable. This is even more the case, as future actions are concerned. The adaptations made by the schools cannot be foreseen and taken into account. Furthermore it cannot be foreseen how the proposals and regulations will be interpreted and changed in their way through the hierarchical educational system. To cope with this problem, the should-situation is derived from an assumed general meaning or intention lined out in the guidelines.

The problem with finding out the needs of schools concerning EE is, that the description of the is-situation is not easy to achieve either. Due to several factors, like the vastness of the country, the is-situation falls into various different 'single realities'. This problem could only be solved through a rough categorization of these 'single realities'. This implies on the one hand, that the need derived from that is only as exact as the categorization of the single realities.
On the other hand, the single realities are already numerous, so that it is quite impossible to overview them all for categorization. Therefore the categorization is only applied to a limited number of single realities. The author has chosen those that were classified as 'typical examples' by experts of CEEC.[52]
The needs of every category of schools found in this way will be analyzed and illustrated by an example.

[52] An additional problem here is that those schools, of which one can find information, are already quite advanced in EE. These kinds of schools are few, but they are distributed all over the country. Therefore they do not allow for a geographic categorization. To take into account the huge number of undocumented schools and their needs, the author will refer to information given to her by various experts in the field.

5.3. How should EE be implemented (should-situation)

The detailed goals of EE have been pointed out earlier. What is done here is to pick out those contents that imply that certain actions have to be taken by the headmaster or the teachers of the school, the local educational administration, the environmental protection bureaus or the hygiene bureau. The contents are taken from SEPA's *Standards for Environmental Behavior of Students,* the MoE's *Plan of Integrating Green Education into the Subject Outline*, the *Targets of Green Education according to School Years*', the *Announcement concerning Special Topics in Primary and Middle School* and the *Educational Program for the Special Topic of Environmental Education in Primary and Middle Schools*'.[53]

These regulations, programs and plans define what a school should do about EE and represent therefore the should-situation for a school.

The documents mentioned above line out the following regulations on EE in schools:

1. Integrate EE in all subjects.
2. Use this special teaching topic to make the students appreciate nature and to monitor the environmental problems in their homes, their living quarters, the nation and the whole world.
3. Make them understand the relationship between a single human, society and the environment.
4. Help the students to acquire the necessary knowledge, methods and skills for that. Help them to develop into students who love nature, have feeling of esteem and environmental behavior so that they can lead an environmentally friendly life.

The contents are then outlined in more detail for the different grades of primary and secondary school. They can be summarized as follows:

<u>Primary school.</u>

Grade 1-3:

Approach nature, draw close to nature and learn to appreciate it. Learn about the relationships between nature and daily life and get to know first, easy rules of environmental protection.

[53] http://www.moe.gov.cn/base/jckecheng/13_3.htm, http://www.moe.gov.cn/base/jckecheng/13.htm.

Grade 4-6:

Learn about the environmental problems in the living quarter/ school area. Study the relationship between human actions and the state of the environment. Adopt environmentally friendly behavior.

Secondary school.

Lower secondary grades:

Learn about national and international environmental issues and their implications. Study the relationship between human/ economic development and the environment. Get to know the principles of sustainable development and teach the students to become active on their own accord.

Higher secondary grades:

Explain the complexity of environmental problems, make it clear to the students that everybody and every part of society has to contribute to the solution. Foster environmental consciousness and feeling of responsibility.

The Ministry opts for 12 hours of EE per year in all grades, except the higher secondary grades, where there should be only 8 hours per year. The times given are not obligatory but can be changed by the schools according to need and resources. The MoE further provides a detailed plan of classroom lessons and outdoor activities, which should be realized in a ratio of 3:1.

The targets to be reached by EE are:

1. The students should gain their own, life-near experience with the environment. Apply the outline by using local materials so that the students are interested and learn to appreciate nature.
2. Start off from subjects the students are interested in and arouse their interest for environmental phenomena and their analysis. Let them develop environmental consciousness and knowledge through their own analysis, experience and reflections.
3. According to the teaching outline, the local conditions and the possibilities of the school new teaching approaches should be used. The lessons should take into account the individuality of each student and each student's different way of learning.
4. Starting off from environmental issue discovered in the school, the living quarters or the family, the students should be encouraged to try to solve these

problems with the knowledge they acquired. Like that, their self-confidence can be strengthened and their taking responsibility in environmental matters can be fostered. Generally, EE should work according to the principle 'one student can activate one family, one school can activate a living quarters'.

5. During class, observe the environmental behavior, the skills and the actions the students take and judge on it. As a result, the teaching methods can be crosschecked and even improved.

5.4. How is EE implemented (is-situation)

These requests hit very different local conditions. Some schools do not have problems to adapt; some others might even lack the most basic equipment or personnel to implement them. After reviewing several dozens of school descriptions from all over the country and after talks with experts, categories of schools have been identified.[54] It could be seen, that the implementation of EE depends heavily on financial resources and the access to information and (higher-) education facilities. These factors determine the resources of a school: On the one hand the kind of technical equipment that is available in school and on the other hand the quality of the education of the employed teachers. As a result of the government policy and various economic and geographic factors, the big cities are economically and culturally more developed than the countryside. Still, the countryside in Eastern and Southern China coastal regions is relatively well to do. Most of the so-called 'remote or poor' areas are found in Northwestern, Western and Northeastern China.

Accordingly, the city schools have been put into one category, the schools in city-near/well to do countryside locations belong to the second category and remote, poor area schools form the third category.

So what is the situation like in the primary and secondary schools of these three categories? Do they implement EE and if yes, with what means and approaches?

5.5. Needs analysis

The overall result of contrasting the should- with the is-situation will be a needs analysis, where the needs and suggestions for action derived from it can logically only give a general direction or focus. It reflects the basic problems and can suggest basic

[54] The descriptions of schools have been taken from www.greenschools.com.cn, www.fon.org.cn.

ways of approaching these. In most cases, the most basic approach will already contribute highly to the strengthening of EE.[55]

5.5.1. City schools[56]

5.5.1.1. Primary schools – description of is-situation

(1) Education.

Many primary schools in the big cities like Beijing, Shanghai and Guangzhou (Canton) have started with EE in the early to mid 1990s. A big part of them has been awarded with numerous prices and has won a number of competitions in the field. They are mostly members of the Green School movement and serve as pilot schools for new projects in EE. Groups of teachers and the headmaster implement the instructions of EE by getting together, writing up material, teaching plans and drawing up activities. In these primary schools pedagogies newest trends are applied. Learning is seen as an individual process of every child. A special emphasis is laid on boosting environmental consciousness by bringing the children close to nature.

(2) Activities.

Activities are normally held on public holidays or during holidays, also including the area the school is situated in, as well as the parents of the children. They children form groups like the 'Little Hygiene Group', the 'Little Greenification Group' or the 'Little Environment Protection Sheriffs'. These groups go outside the school and help the local administration to keep the area clean, make it more beautiful or detect problems. During the school year the students are encouraged to participate in sorting rubbish and spreading their knowledge to their parents. The teachers also try to include the parents by offering information on regulations and reading materials on environmental issues together with them.

(3) Equipment.

The schools are generally equipped with classrooms for arts and music, a library with environmental literature, a computer pool and an outdoor playground. Generally, there is no lack whatsoever in devices to display environmental issues to the children via television, computer, video or printed matters. An example for this kind of school is the

[55] For an overview of the is-situation and needs of the different area schools please refer to the appendix figure 4.

[56] In China, all schools charge school fees. The schools categorized here belong to those with higher fees. The less expensive city schools are normally equipped like those in the second category.

Beijing White Cloud primary school in the south of Beijing. This school has started to teach EE only in 1999, but has a special facility on the upper level of the building: The Green Education Center. The center has

A green hallway painted like a jungle.

A green cinema.

Two laboratories for kids' experiments.

A studio where paper is handmade, cotton bags are sewed.

A seminar room and a water room.[57]

5.5.1.2. Primary schools – description of needs

The description above shows, that primary schools focus mostly on new pedagogic approaches in EE. This is due to the fact, that 'hard facts' (knowledge) about EE is too complicated for children of this age. What these primary schools need are more elaborated ways of bringing children close to the environment while encouraging at the same time their own initiative.

The teachers working in these schools do not lack access to relevant information, neither in the field of pedagogies nor in the field of environmental protection. Unfortunately, there are not so many materials the teachers could adhere to. Only very few teachers textbooks provide 'fresh' ideas or the latest trends. The need therefore is:

- More 'case study' textbooks to give the teachers new ideas.
- Training with experts from other countries to share experience and develop new approaches to pedagogies.

This will help to further promote EE in primary schools in big cities.

5.5.1.3. Secondary schools – description of is-situation

(1) Education.

Compared with the primary schools, EE in most secondary schools has even started in the end of the 1980s, beginning of the nineties. Most of these schools have been awarded with the Green School status or even take part in other international programs like the *GLOBE* program.[58] EE generally started off at the initiative of the headmaster or the vice headmaster. They then set up a working group with several teachers, local education administrators, political cadres and experts in environmental protection and

[57] http://www.umweltschulen.de/internat/china/ulo.html.
[58] See section 6.2.

drew up the implementation plan for EE. Sometimes this plan is set up unified for a whole city. This most times implies the setting up of a working group that writes up textbooks and other materials.

According to the teaching outline on EE, the schools aim at including EE topics in every subject. Most middle schools have in one way or the other applied methods of 'new pedagogies' encouraging the students to think critical, ask questions, take their time to investigate, work physically (in a garden) and explore their living area (leave the classroom). One middle school in Guangzhou that dates back to 1888 has made EE topics an obligatory part of exams. The specialty of this school is that it has a botanical garden as its school garden. The students are involved in taking care of it, so that they come in close contact to nature. The garden hosts even several rare species of trees, providing visual aid for the class on the preservation of species variety.[59]

(2) Activities.

The students in secondary schools are between 12 and 18 years old. At that age, the students can work already independently. The activities in secondary schools involve taking part in workshops or small discussion groups, organize commemoration days, do propaganda work for environmental protection on the streets, write up wallpapers and 'news'-papers and go on summer camp. Summer camps are usually held in scenic spots for those interested in the environment. They are also an opportunity to meet with students from other EE schools.

More regular activities involve small groups collecting old batteries, paper and other goods for recycling. Some of the middle schools have set up regular workshops on different topics of EE, inviting experts from universities or environmental protection organizations. With their essays, papers and knowledge on the environment the students regularly take part in nation-wide competitions. Winning prizes for either the design of the school garden, the curricula, or plant determination is a very popular activity.

(3) Equipment.

Many secondary schools in big cities are equipped with classroom buildings including physics and chemistry rooms, classrooms for arts and crafts, libraries, sports grounds and some have swimming pools. Secondary schools are normally partly boarding schools so they are also equipped with dormitories for the students. Generally, there is no lack in technical equipment. Computer rooms are provided either inside the campus

[59] www.greenschools.com.cn\greenschools\zhglsxx\gd\110701.htm.

or as Internet cafes outside the school grounds. An interesting example for such a middle school is the Guangya middle school in Guangzhou (see above). When the school built new dormitories and a new sports ground, environmental considerations were included in the planning. The wastewater of the swimming pool is processed and used to water the grass. While building the new dormitories special emphasis was laid on saving energy. A solar unit on the roof provides the warm water for the building.[60]

5.5.1.4. Secondary schools – description of needs

In secondary schools the focus of EE already lays on the getting across of special knowledge as well as on building up consciousness and responsibility for the environment. In the educational area, the difficulty lies in incorporating EE in every subject across the curriculum as suggested by the MoE. This asks of every teacher to know the environmental aspects of his/her subject. Moreover, the way of teaching these aspects of EE demands the application of teaching methods like partaking teaching, group work and activity-oriented teaching.

This means, the teachers have to upgrade their knowledge about environmental matters as well as on pedagogies. Another aspect is the persistent lack of material. There are only very few textbooks available for reference. There seems to be practically no material on environmental aspects in a certain subject, e.g. 'Chinese', which could give the teacher more ideas of how to incorporate EE into his/ her field. Out of a lack of references, most teachers stick to the outlines they once made up themselves. The need is therefore:

- Trainings, workshops or regular meetings with other teachers to enhance the knowledge of pedagogies.
- Writing up material to provide every single subject in secondary schools with ideas on how to link to EE in order to facilitate the implementation of EE.

5.5.2. Conclusions for city primary and secondary schools

In general the primary and secondary schools in big cities have a need for teacher training in 'new' pedagogies and a need for more detailed materials. Another source of inspiration for the teachers could be a mutual exchange of experience. It would therefore be helpful to set up regular meetings in each municipal district. This could be

[60] www.greenschools.com.cn\greenschools\zhglsxx\gd\110701.htm.

personal meetings, pin boards or bbs servers in the internet (chat rooms). As was pointed out by an expert, the sheer problem in this regard is the teachers' lack of time. Still, networking remains an important way how to boost the dissemination of EE in the cities.

5.5.3. City-near/ well to do countryside schools

5.5.3.1. Primary schools – description of is-situation

(1) Education.

The kick-off of EE in the cities has relatively quick also spread to the schools situated in the suburban areas or in the countryside between the larger cities, particularly on the East coast. From the middle of the 1990s onwards, EE has been implemented in these schools. The headmaster or other high-ranking teachers have introduced EE. Most of the schools lacked the personnel to set up the teaching plans and actually teach environmental matters. So after setting up a project group around the headmaster, they invited local experts on environment or even professors from nearby universities to help them design the implementation of EE in their curricula. Most schools realized that teacher training was essential to promote EE. At that time, the official policy to promote EE had already spread from the cities to the nearby countryside. Like that, teachers interested in environmental matters attended seminars and workshops that were organized by local environmental protection bureaus in cooperation with SEPA. In some schools where teachers had contact to foreign countries, foreign experts were occasionally invited.

The pedagogies these schools apply are relatively advanced, but seem to be always one step behind the pedagogies applied in the cities. This is due to the fact, that the teaching materials they use are normally those printed by their local educational press. The advantage is that the case studies and examples are local, but at the same time the materials have deficits in incorporating 'new' pedagogical approaches. Apart from pedagogies the schools are mostly able to implement the time schedule requested by the MoE. Among the schools approx. 30% have been awarded with the Green School status on different levels.[61]

[61] Source: Own estimation.

(2) Activities.

The primary school children of lower age (6-9) are encouraged to work in the school garden, grow their own plants and take care of plants at home. They are taught how to use the environmental bookshelf in the library and form small groups to read the books. They take part in the activities on commemorative days and do role-plays on environmental topics. The older children (10-12) are taken outside school on excursions to local factories, water treatment plants and local nature reserves. In summer they can go on a 'green' summer camp to meet with other students from different areas.

In most schools, the focus is very much on the 'greenification' of the schoolyard. As the schools are situated in half-rural to rural areas, dust and erosion is a problem. So most schools choose first to ameliorate their schoolyard before they start with other projects in EE. In some schools EE is even misunderstood to mean only the 'greenification' of the school.

(3) Equipment.

In general, the schools in these areas are quite well equipped. There are normally classrooms equipped for simple experiments. Sometimes there are no specific rooms dedicated to chemistry or physics, but the devices needed can be found nevertheless. Most of the schools have outside sport facilities and a school garden. The technical equipment like computers, TV and the like might sometimes be rather old. Some schools do not possess a computer room but only some computers for the teachers. Nearly all schools have a library equipped with literature on environmental matters. The access to new materials is limited out of logistical and economical reasons.

5.5.3.2. Primary schools – description of needs

The schools in these areas need to catch up with the pedagogical trends in the big cities. In many places, the teachers have heard about the new approaches, but still have difficulties to apply the methods. This might be a result of their age or their education. The trend to stop front teaching and do partaking-teaching is quite new. Teachers who received their formation years ago did not have a chance to learn about it. In many cases even younger teachers also did not have the chance, because the Normal University they graduated from did not teach these new approaches.

Furthermore there is a relatively narrow range of activities the schools offer to their students. Especially the focus on the 'greenification' of the schoolyard needs to be

changed. It seems very clear that there is a general lack of new ideas and in some places even a complete misunderstanding of how to implement EE.

The need in this regard therefore is:

- More teacher training concerning the 'new' pedagogies including activity-based learning.
- Training on how to connect the contents of EE with these new approaches.
- Trainings and seminars to spread the real meaning of EE among the teachers.
- More networking among the teachers to share experience.

5.5.3.3. Secondary schools – description of is-situation

(1) Education.

EE in secondary schools in these locations also started off in the mid 1990s. Like in primary schools, it was the headmaster[62] who initiated the movement for EE in most schools. The headmaster then formed a group of teachers, education officials and environmental experts. In some cases, the headmaster went to take part in a training and became himself the multiplier of information. The next steps then consisted in setting up a teaching outline, organize workshops for the teachers and purchase material like books and textbooks. For some areas, there are no textbooks with a local background available, so that those with a pure city background have to be used.

The pedagogies employed to teach EE are similar to those used in primary schools. Most teachers are not familiar with the new approaches out of the same reasons as mentioned above. A lack of environmental knowledge and the knowledge about environmental aspects in their respective field seem to be obstacles. Apart from geography and chemistry where the connections to the environment are more obvious, teachers of other subjects seem to have problems with the hard facts.

(2) Activities.

This can be seen from the activities these middle schools take. According to the MoE their focus should be on building environmental consciousness and responsibility. Most of the middle schools engage in the same activities like the primary schools. The students are to take care of the school garden, take part in activities for commemoration days and collect waste paper, old batteries and plastic. A popular activity again is to assist the municipal administration in cleaning up the area and detecting sources of

[62] This is due to the hierarchy in the Chinese education system, so that the headmaster is always one of the most important target persons for implementation of projects.

pollution. The creation of consciousness for the environment is mostly reached through teaching the students to save water, energy and plastic bags. The students are also encouraged to write up essays on environmental problems and take part in competitions on environmental knowledge. Moreover, the students are to contribute to the dissemination of environmental knowledge to their surroundings by going out into the quarters or by inviting their parents to their school for role-plays. In summer holidays the students normally have the chance to go on a summer camp where they can learn more about the environment.

(3) Equipment.

Like the primary schools the secondary schools are mostly equipped with the basic devices for chemistry and physics as well as electronic devices. In an average middle school the computer pool, if there is, is only open to the students within limits. Local teaching materials are available in some areas and libraries are mostly equipped with literature on environmental issues. Sports grounds for outdoor activities are usually there, as well as a school garden. The quality of these facilities varies greatly from school to school.

5.5.3.4. Secondary schools – description of needs

Like in primary schools the secondary school teachers need to catch up with the latest teaching methods. The monotony of activities shows that there is a certain lack of 'fresh' ideas on how to raise environmental consciousness and encourage the students to take over responsibility.

An even more important point in secondary schools seems to be the lack of environmental knowledge, which disables the teachers to implement EE in their subjects. In this regard, most of the local material does not contribute much to an enhancement of the situation. It generally contains very few case studies and no explanations of teaching methods. Neither does the material take into account the local conditions (geographical, cultural). The needs of secondary schools in city-near to rural areas are therefore:

- Train the teachers in 'new' pedagogies.
- Write up textbooks with rural area background including case studies on activities.
- Improve the teacher's knowledge on environmental issues.

- Train the teachers to implement EE in their subjects.
- Contribute to the networking among the teachers to encourage higher efforts.

5.5.4. Conclusions for city-near/ well to do countryside schools

Generally speaking, schools in city-near/ well to do countryside need to catch up with the latest trends in the cities. This can be achieved through training the teachers in local workshops not only in pedagogies but also in hard facts on EE. The understanding of EE needs to be clarified so that the 'greenification' misunderstanding is wiped out. To back up the workshops it would be desirable to write up teacher materials with new ideas on activities in EE as well as to provide textbooks with rural background.

5.5.5. Schools in remote/ poor areas

5.5.5.1. Primary and secondary schools – description of is-situation

In remote and/or poor areas the situation of primary and secondary schools is so very much alike, that both school types can be described together. It is hard not to be too pessimistic about education in China's rural areas. The schools in these areas mostly lack all kinds of resources and equipment.

(1) Education.

Teachers in these areas are trying their best to implement EE in their schools. Unfortunately, they have very limited or even no access to materials on new teaching methods or contents of environmental education. So in many schools there is still traditional front teaching done. This is not only a result of a lack of knowledge on the side of the teachers, but pure necessity: A single teacher often has a class of 80-100 students to teach. This limits the implementation of EE through partaking-teaching considerably. To implement EE into the curriculum is also practically impossible for these schools. This is due to the fact, that the workload of the students is already quite high, as some of these schools adapt to the peasant's rhythm and do not teach during harvest times.

Generally, there are initiatives in some schools to teach the students to respect nature, protect the environment and to save resources. Still, there are only very few schools where this is done systematically. Most initiatives are projects, so they aim at getting rid of a certain problem within a certain timeframe and at a certain amount of money. In

some areas, EE is recently taken over by NGO workers who come to the school for two to three days per year to teach the children about the environment.

(2) Activities.

Activities in these schools involve caring for plants or, if there is, for the school garden. Some might organize activities at the commemoration days concerning the environment. In some areas, the students go on excursions to visit scenic spots near the school, analyze the ecological interrelations and learn about local trees, plants and animals. Local farmers and local production plants are also included in the excursions. The students will then write essays about their experience and findings. Under the guidance of teachers the students occasionally involve in cleaning up activities. In some schools sorting waste has been taken up as the result of a project. This ensures the school some revenue from selling the recyclables. This allows the financing of other projects or a school garden.

(3) Equipment.

The equipment of primary and secondary schools in remote rural areas is very limited. Occasionally, they might have the basic equipment for chemistry and physics lessons, allowing simple experiments. Most of the schools are equipped with a sports ground, which might be an open space near the school. In some areas, where nature is rich and abundant anyway, the schools do have school gardens. This is not the case in areas, where arid and stony soil prevails. On the side of technical equipment, some schools have a few computers for the teachers use. In most cases, there are no libraries, let alone literature on environmental issues.

5.5.5.2. Primary and secondary schools – description of needs

The needs of primary and secondary schools in rural areas are numerous. They are a big step behind the economic development in the cities. This again causes an underdevelopment in the area of education. As a result of the distance to cultural centers, there is not even access to information and materials. Concerning materials there is the additional problem that up to date there is rarely any material available with rural background (a description of rural environmental problems) and even less with *local* rural background.

The present situation is a result of the government policy, which still puts development in the cities and coastal regions first. Since the late 1990s several NGOs have

recognized the need and set up programs like the FONs 'Antilope bus program'. A small bus equipped with material and experts in EE travels the remote areas of China to bring EE to the children there.[63]

The needs of rural schools can therefore be specified as follows:

- Financial support to implement small projects in which students can participate.
- Financial support for schools to buy materials on environmental matters.
- Financial support to allow schools to buy equipment for simple experiments in the field of EE.
- Teacher-training in pedagogies and environmental issues.
- Writing up of material that fits to the local rural conditions.
- Establishment of a (postal) newsletter service to bring the teachers into contact with each other.

5.5.6. Conclusion for remote/ poor area primary and secondary schools

The rural area schools are surely the ones who need most help to take some initial steps in teaching their students to become environment friendly citizens. Projects aiming at this kind of schools will show positive results very quick, as the need for action is urgent. In some cases, schools could do projects on EE with very limited funding. To help these schools is the aim of the Hand in Hand Earth Village movement. Also some NGO have been active in this area. Still, much more waits to be done.

6. Protagonists of Environmental Education in China

As a result of the *National Action Program* and the growing awareness for the need of providing education on environmental problems various initiatives have been started. Basically, there are two sorts: Those initiated by the Chinese government and initiatives by non-governmental or foreign organizations.

6.1. Governmental initiatives

There are several programs initiated by the Chinese government. They are carried out without a foreign partner and are set up nationwide.

[63] See section 6.3.3.

6.1.1. Green Schools

The Green Schools movement began in Europe in 1994 with the implementation of a project called 'eco-schools plan' by the European Foundation for Environmental Education (FEEE)[64]). In the year 2001 the project had already spread to over 21 countries with close to 6000 schools taking part. In Ireland it was called 'green schools', in Germany 'environmental schools', in Portugal 'ecological schools'. Although the name being different, it is all about the same intentions. These are to use the basic features of environmental protection and environmental education and to apply them to every aspect of school life. This includes the layout of curricula, in-class and out of class teaching, school management, the student-teacher relationship as well as the design of the schoolyard and scheduled projects.

The interaction and links between partaking schools were strengthened by setting up a yearly conference and establishing a website. Soon the project spread all over the world and was implemented also in Hong Kong and Taiwan. In 1996, the project had reached the Chinese mainland.

The Green School Program is one of the environmental education initiatives explicitly mentioned in the *National Action Program* of 1996.[65] It stipulates (part two: environmental education, paragraph 2.11):

"By 2000, we should have gradually founded "Green Schools" across the country. As the main indicators of such schools, their students shall conscientiously learn the contents of environmental protection included in the teaching materials of various courses, the teachers and students have intense environmental consciousness, they shall take an active part in environmental supervision, publicity and education geared to the needs of society, and their campuses shall be clean and beautiful."[66]

Schools that apply for the Green School status are therefore expected to fulfill the following criteria:

- A headmaster who displays an active interest in environmental topics.
- The headmaster and teachers in charge participate in environmental education training courses.
- Curricula that include environmental topics related to environmental protection and sustainable development.

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[64] Fondation Européenne de l'Education Environnementaux.
[65] www.wuzhou.gov.cn\wzhbj\lsxx\lsxx1-1.htm.
[66] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 47.

- Active commemoration of designated days of environmental significance, such as Earth Day (22nd of April), World Environmental Day (6th of June), World Animal Day (4th of October) and World Biodiversity Day (29th of December).
- A clean schoolyard and a garden on the campus.[67]

To fulfill these criteria, the schools need to invest money they usually raise through school fees. Especially on building the schoolyard some schools spend disproportionate amounts of money. One school spend the equivalent of 100,000 € to build a park on their grounds. As a result, only schools whose students are comparatively well off can afford a beautiful schoolyard. On the other hand, schools that have attained the status of a Green School will attract more well off students, as environmental protection is quite chic. Despite this, there are also schools that have achieved to build school gardens without using a lot of resources.

Inspection teams made up of representatives from local PECs (Provincial Environmental Committees), education authorities and officials from the propaganda departments of the Party have been awarding Green School status to primary and middle schools since 1997.[68] In the year 2000 there were 3,207 Green Schools nation-wide. By June 2004, altogether 17,240 schools out of the approximately three million Chinese schools had been awarded the Green School status.[69] This already indicates the growing popularity of the program. The program's focus is on primary and secondary schools, but lately also kindergartens are encouraged to take part.[70]

The title of a Green School is awarded at municipal, provincial and national level. The bigger part of the Green Schools is present at municipal level. Currently, there are Green Schools in all the independent cities and all the provinces.[71] Surely, their level varies greatly because of different living standards and resources. The *National Action Program* anticipated this inequality. It points out that every school should struggle to fulfill the conditions of a Green School according to its own means and local conditions.[72]

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[67] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 47.
[68] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 47.
[69] http://www.greenschools.com.cn/greenschools/zhglsxx/fzfx01.htm.
[70] www.wuzhou.gov.cn\wzhbj\lsxx\lsxx1-1.htm.
[71] Please refer to figure 5 in the appendix.
[72] www.wuzhou.gov.cn\wzhbj\lsxx\lsxx1-1.htm.

While the program has proved successful in encouraging schools to become more environmentally aware and active, problems remain. Mr Zeng of CEEC (SEPA) has identified the following deficits in 2001: a lack of teacher-training for environmental education, very little documentation of environmental education activities in the majority of schools, little to no exchange between and networking among the Green Schools and no regular contact with education and environmental authorities.[73]

Apart from that, problems remain also in administrational matters. There are still some provinces where only a fraction of the Green Schools is registered. Even if registered, in some provinces it is more important to boost the number of Green School instead of monitoring the quality of their work.

Generally, several achievements have been made in recent years: More and more provinces have established Environmental Education Coordination Committees or Steering Committees for Green Schools. The focus is now on headmaster and teacher training in environmental education, with an increasing number of training workshops organized on provincial level.

To solve the problems on the administrational level, CEEC of SEPA has provided regular training for officials working in the provincial level environment protection agencies.[74] Furthermore there are nation-wide conferences on the development of the Green Schools to provide a forum of contact for headmasters and teachers.

6.1.2. Hand in Hand – Building an Earth Village

"Hand in Hand, Building an Earth Village" is a long-term project aiming to provide Chinese children across the nation with environmental education and opportunities for interaction with the environment."[75]

Quite a number of Green Schools participate in the activities of the Hand in Hand – Building an Earth Village project.[76] Since the beginning of 1996, the Chinese Aid Committee for the Culturally Disadvantaged, the National Working Commission for Children, the National Environmental Protection Bureau [now SEPA] and the Chinese Teenager's Journal have been jointly sponsoring the project. The program encourages kids to collect recyclable items. These items are then sold to recycling companies. The

[73] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 48.
[74] http://www.greenschools.com.cn/greenschools/zhglsxx/fzfx01.htm
[75] http://127.0.0.1:800/Default/childrenandearth.org.cn/english/index.htm
[76] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 48.

revenues from these sales are donated to build new schools, 'Hand in Hand Environmental Protection Primary Schools', for children in poverty stricken areas. Till today, millions of Chinese children have taken part in the project. In total there are approximately 800 schools taking part in the program, 120 of which are in Beijing.

Those schools establish a Little Earth Village where students take over positions like village magistrate, environmental experts, journalists and accountants. There is an advisory committee and a supporting group made up of teachers and parents respectively.[77] The student journalist issue reports and notes on their activities in an 'environmental bulletin', the student accountant keeps track of the revenues from the sales of recyclable materials. The equipment of a Hand in Hand school consists of three sorting containers, a wheel-cart, a blackboard, a book shelf, books and materials (posters, films) on environmental issues, an environmental codex for the Earth Village citizens, two flags and a board with the Earth Village emblem. To establish such a center costs approximately 12,000 RMB (1,500 USD).[78] In 2001, Hand in Hand has supported 40 schools in Western China to establish such an Earth Village within their school. The funds for these activities are also partly covered by sponsors.[79]

What makes the Hand in Hand project stand out from other environmental protection projects is its community-oriented goal to use the revenue to help children in poverty stricken areas. Furthermore, the Earth Villages organize activity days and invite parents, grandparents and the people living near the school to their center, where they display their former projects and achievements. Like that the children pass on their knowledge to their social surroundings.

The China Children News and the Youth Hand in Hand Earth Village Activity Bureau are supervising the Earth Villages and act as coordinators.

6.2. International Programs

Apart from the wholly Chinese managed projects, there are projects that are coordinated by the Chinese government, but have their initiators or headquarters abroad. The largest project of this kind is the *GLOBE* project (*G*lobal *L*earning and *O*bservations to the *B*enefit of the *E*nvironment).

[77] http://127.0.0.1:800/Default/childrenandearth.org.cn/dqc/join/organization/DQC-2-1.HTM
[78] http://127.0.0.1:800/Default/childrenandearth.org.cn/dqc/help/dqc-3-1.htm
[79] Sponsors are companies like Ford and General Electrics as well as foundations like Earthview, Green River or the Japanese Embassy to China.

56 Chinese schools currently participate in the *GLOBE* School program, which was initiated by the former Vice-president of the United States, Al Gore. It is implemented in 106 countries around the world. The program focuses on building international networks of schools to observe and protect the environment. Participating schools receive teaching aids and technical equipment (computers, meteorological instruments). Principals and teachers responsible for the program are regularly invited to training workshops. In China, the CEEC of SEPA is responsible for coordinating the *GLOBE* program in China.

Schools nominated for the participation in the program usually have experience in the field of environmental education. Normally, they were part of the Green Schools program before becoming a *GLOBE* school.

6.3. Non-governmental/ foreign initiatives (NGOs)

The *National Action Program* and the recent reforms in the educational system show the importance the Chinese Government attaches to environmental education. It has been pointed out above that the vastness of the country demands huge resources in order to catch up with the targets set in the programs.

As the government does not have the resources to follow its commitments, a niche for the development of NGOs has opened in recent years.[80]

Since the mid-nineties, various social initiatives have applied for recognition as a social, non-governmental organization. Nevertheless, these non-governmental organizations are not what is generally understood by the term in western countries. They are closely linked to government organs through the approval procedure, which involves that an NGO has to have a governmental sponsor. Like that, the Ministry of Civil Affairs as the approving body can always in one way or the other influence the work of the NGO.[81] In recent years, certain NGOs have taken over parts of former government work, especially in the field of education. Like that, they provide a welcomed help to implement government guidelines.

6.3.1. Roots and Shoots

The Roots and Shoots Project of the Jane Godall Institute is slowly taking hold in China. The NGO has two offices, one in Beijing, the other in Shanghai. Roots and Shoots is an

[80] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 49.

[81] For convenience, the term NGO is continuously used in this paper but needs to be read with keeping the points mentioned above in mind.

environmental and humanitarian program for young people from preschool up to university. Roots and Shoots has set itself the goal to "foster respect and compassion for all living things; to promote understanding of all cultures and beliefs, and to inspire each individual to take action to make the world a better place for animals, the environment and the human community." [82] Furthermore, Roots and Shoots strongly promote the thought that every individual can contribute to change. So, Roots and Shoots groups normally consist of one enthusiastic teacher/ adult/ student who encourages other students to form small groups.

The groups then examine issues pertaining to community, environment and animal welfare. They are given a textbook that acts as a guideline on how to think about their own position within their environment.[83]

Following this, the group identifies problem areas of environment, animal-welfare and the human community. Then they discuss how those may be addressed. The group will then plan what to do to solve these issues. The funds needed to take action are acquired through fund-raising actions and by encouraging members of the community to take part in their activities. Local Roots and Shoots groups are expected to carry out at least one project in each area mentioned above. They are encouraged to communicate their projects to the 'headquarters' in Beijing, through which they can also contact other groups abroad.

The most challenging about this program is the responsibility given to the students to act on their concerns. Traditionally, education in China has promoted 'front teaching', not expecting the student to take any action apart from listening. Like that, it is sometimes hard for the students to come to terms with the approach of this program. Nevertheless, through the introduction of these new methods, Roots and Shoots greatly contributes to the advancement of educational reform in China. Students become more and more accustomed with self-motivated and self-directed learning, exploring new ways and thoughts by themselves.

In the long term this also has the potential to impact significantly on state-society relations as students learn the power of their own agency and find themselves increasingly wanting to act upon it.[84]

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[82] http://www.jgichina.org/english/aboutus/e-aboutus.htm.
[83] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 51.
[84] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 51.

In recent years the Roots and Shoots movement has developed slowly but steadily.
To date, more than 200 groups involving over 50,000 students from pre-school to university age have been formed in 30 provinces around China.[85]

6.3.2. WWF[86]

In order to strengthen and promote the quality of environmental education in China, the MoE, the WWF and BP Amoco kicked off the 'Primary and Middle School Green Education Movement' in 1997. In its first phase, the project undertook the establishment of teacher training centers at Chinese Normal Universities in Beijing (Beijing Normal University), Shanghai (Huadong Normal University) and Chongqing (Xi'nan Normal University). The centers' coordinators received training from British environmental educators. The teacher training center in Beijing was officially opened in December 1997. From then onwards, the center has been training primary and secondary school teachers and headmasters.
At the beginning of 1998 eight pilot schools were chosen. The prerequisites to enter the program were the commitment of the headmaster and the teachers to environmental education. Political and financial support by the local officials and sponsors was also vital. The schools then documented their environmental lessons.
Through regular training and supervision, the centers' coordinators ensured that the program was implemented smoothly in the schools. The initiative also published a teacher reference book and a quarterly magazine.[87]
In 2000 the first phase was completed. The project has been completed in the meantime. It has shown a considerable effect on the promotion and the quality of environmental education. Up to date, the teacher-training centers are very active. At Beijing Normal University a course in environmental education is now obligatory for all students.

6.3.3. Friends of Nature (FON)

Liang Congjie, the grandson of the Qing-dynasty reformer Liang Qichao, founded Friends of Nature (FON) as an NGO. It is one of the few Chinese NGOs that does not

[85] http://www.jgichina.org/english/aboutus/howwe.htm.
[86] The WWF can be seen as a representative of the many non-chinese organizations and institutions that sponsor EE in China. This paper mostly concentrates on those organizations whose focus is on EE and who implement the projects themselves. To list up all sponsors of EE in China like UNEP, EU, Heinrich- Boell-Foundation, GTZ etc would be inproportionate to the scope of the paper.
[87] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 50; Beijing Normal University, Huadong Normal University, Xi'nan Normal University Environmental Education Centers (1999); Green Education Newsletter.

receive any financial support from the government. At the same time it is also one of the most well-known and active NGOs in the field of environmental education, the group's main aim. Their mission is "to promote environmental protection and sustainable development in China by raising environmental awareness and initiating a 'green culture' among the public." [88] Even if their mission is to educate the public, FON believes that to spread environmental awareness among children has to be the center task. To achieve this goal, FON has launched several initiatives. Among them, the 'Environmental Education Van Program' and 'The Green Hope Initiative' have been launched in 1999. Another, the 'Better Environment Scheme' is sponsored by Shell and was launched in 2000.[89]

The Environmental Education Van was organized with the help of the German NGO 'Save Our Future'.[90] The van is named after the endangered Tibetan antelope 'Antelope Bus', and is equipped with teaching materials for environmental education that are mainly game based. The 'Antelope Bus' is stationed in Beijing. A second bus is named 'Wild Horse Bus' after the endangered wild horses. FON has passed it on to another NGO in Southwestern China so as to spread the concept to this area, too. For RMB 100 (USD 12) per day, urban schools can arrange for the bus to come to their schools. The students then experience an extra-class lesson with the 'onboard' environmental educator.[91] In rural areas, the schools can order the bus for free. So far the project has been a great success, teaching hundreds of children to "listen to nature, to revere all life and to understand the laws of ecology".[92]

The FON's Green Hope initiative specializes on the promotion of environmental awareness among the secondary school students in the countryside.

The Better Environment Scheme, which is implemented by FON and sponsored by Shell Companies, encourages primary and middle school students to design and implement environment protection projects in their own communities. The best-designed projects will be awarded and sponsored by Shell for implementation. In 2000/ 2001, some 100 project-designs were collected in Beijing. Among those, 19 designs came from primary schools, 71 were from middle schools. These designs generally are

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[88] www.fon.org.cn\index.php@id=257 .
[89] www.fon.org.cn\index.php@id=253.
[90] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p.51.
[91] The concept is similar to the concept of the ‚Environmental Van' in Germany, like the 'Ökomobil Tübingen'.
[92] www.fon.org.cn\index.php@id=252.

about animal rescue, recycling, tree planting, garbage classification, water pollution, wastewater treating, disposable utensils etc.[93]

The nature education site and the memorial site for endangered species at the Peer David's Deer Reserve in Daxing county, south of Beijing, is another FON project. The park offers tours to schools guided by an expert in endangered species.[94] FON has also founded a bird watching group in 1996 that visits many places to watch birds. The members have the chance to hear ornithological lectures by university professors. Moreover, the group participates in editing materials on birds, like the 'Beijing Wild Birds Handbook'.[95]

FON is also active in organizing tree planting activities to the outskirts of Beijing; they were the first organization to promote follow up care, arranging return trips to tend trees recently planted.[96]

6.3.4. Global Village of Beijing (GVB)

The mission of GVB is "to help China achieve sustainable development by advancing the public environmental movement."[97] To achieve this aim, GVB concentrates on creating awareness for environmental issues through the mass media. The NGO has produced a weekly show on environmental issues that was shown on the China Central Television (CCTV), a nation-wide channel, from 1996 to 2001. GVB is very active in the field of television. They have a team of specialists that has created a number of TV series in the last years. The topics range from international experience in protecting the environment to a series on biodiversity and culture diversity. The aim of GVB is to use TV to "emphasize the public's right and responsibility to participate in environmental activities, giving prominence to sustainable consumption issues and policy development."[98]

Besides television, GVB also issued a number of guidebooks, posters, VCDs (Video CDs) and brochures for the distribution in public. Together with SEPA, GVB has issued the *Citizen's Environmental Guide* and a *Children's Environmental Guide*. Besides

[93] www.fon.org.cn\index.php@id=253.
[94] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 51.
[95] www.fon.org.cn\index.php@id=255.
[96] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 52.
[97] http://www.gvbchina.org/English/intro1.htm.
[98] http://www.gvbchina.org/English/tvprogram1.htm.

these, GVB publishes academic reports on subjects related to its work and organizes forums at the occasion of environmental days or the like.[99]

GVB also runs a large conservation site 40 km out of Beijing, the so-called 'training center'. The 'training center' serves as a place for environmental training, exhibition and experiencing the nature. Regular activities are held there. During those the public can experience the way of life of a farmer, as well as outdoor activities like bird-watching, tree identification and wetland life observation.[100] In the future, the NGO plans to build some 'green' (environmentally friendly) houses in order to introduce environmental protection technology. They also plan to promote eco-farming on the grounds of their training center. GVB also runs activities for children, but the focus of the NGO is to educate the broad public.

6.4. Mass Media

As the focus of GVB shows already, the mass media are an important tool to create awareness of environmental problems in public. One of the most important mass media in this regard is television.

6.4.1. Television

In recent years, the Chinese government has encouraged the documentation of environmental issues within a certain frame. The documentaries are mostly about small-scale pollution caused by smaller enterprises. There is no coverage on environmental aspects of prestigious projects like the 'Southern water runs North'[101] plan. Very popular topics for coverage however are the commemorative days like Earth Day or Tree Planting Day, or national environmental symbols like Panda bears.[102] This selective coverage mirrors the intention of the Chinese Government to use the mass media as a means to construct socialist culture as well as to foster national identity through displaying unity in aims.

One of the oldest and most successful NGOs in the field of television is the Environmental Education Television Project for China (EETPC). It was founded in

[99] http://www.gvbchina.org/English/provide%20infor.htm.
[100] http://www.gvbchina.org/English/trainbase1.htm.
[101] The northern Chinese plain has a tremendous lack of water, whereas in the South water is still relatively abundant. The plan involves the building of a canal of several hundred kilometres to bring the water of southern rivers to the North. A project of the same magnitude is the Three Gorges Dam.
[102] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 52.

1994 by a group of Chinese and long-term foreign residents in China, who began to discuss how they could help China to shoulder the burden of educating its people about environmental issues. Because of the vast geographic area and the huge population, they quickly turned to television as a means to spread environmental news. The group then got in touch with the international NGO 'Television Trust for the Environment' (TVE)[103] based in London, which hosts the world's largest library of copyright cleared environmental television programming.

EETPC then teamed up with several governmental and non-governmental forces and started off with producing Chinese versions of the TVE films in 1997.[104] Up to date close to 200 films have been dubbed into Chinese. The films on VHS and soon on VCD are distributed to schools, universities, and environment groups. Furthermore, they are directly given to Chinese government organs such as the governors of every province and the mayors of all the major cities in China. Like that EETPC has established a very well working distribution network for its films.

In the meantime, EETPC has produced also a number of films on environmental problems in China.[105]

Today, the EETPC is providing broadcast programming to over 75 different Chinese television programs. On Central Chinese Television EETPC placed a segment of the TVE production for WWF, 'Earth Report', in China named 'Environment Express' reaching 100 million viewers each week.[106]

Very early, EETPC also recognized the lack of teaching material on environmental matters and encouraged the creation of the Earthscan China Committee. This committee is, together with the Chinese Academy of Sciences and the Science Press, translating and publishing Earthscan publications[107] in China. Furthermore, EETPC has encouraged the creation of the China Environment and Sustainable Development Reference and

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[103] The UNEP, WWF and Carlton Television in turn have set up TVE in 1984. The mission of the TVE is to deliver environmental education materials via television to every person on the planet. To all the countries on the United Nations low and middle income list the TVE delivers these materials from free. (See: www.eetpc.org\index.htm).

[104] These government forces are: The Institute of Science, Technical and Scientific Information of China (ISTIC) of the Ministry of Science and Technology; The Chinese Academy of Social Sciences (CAS) and the Center for Environmental Education and Communications (CEEC) of SEPA. There are also three NGO partners: The Global Village of Beijing (GVB), Friends of Nature (FON) and the WWF China Programme Office. (See: www.eetpc.org\partner.htm).

[105] www.eetpc.org\cfilms.htm.

[106] www.eetpc.org\index.htm.

[107] Earthscan is a British publishing house specialized on environmental literature.

Research Center (CESDDRC) within State Environmental Protection Administration (SEPA). The CESDDRC functions as the internal library for several very important units of the SEPA, including the ISO 14000 Secretariat, the National Policy Research Institute for Environment and Trade, the National Hazardous Waste Transportation Licensing Board, the National Environmental Monitoring Centre, the Open Laboratory, the CEEC and several other units. The CESDRRC is also an open center that provides information and services to NGOs, educators, environmentalists, scholars, researchers, journalists, international development agencies and other concerned individuals.[108]

6.4.2. Print media, movies and internet

Besides television, the coverage of environmental problems in the print media has steadily increased in the last years. Print media operate under the same official restrictions as TV, but the style of reporting has nevertheless become surprisingly critical. In some cases, media documentation in TV and in the newspapers helped to solve local environmental problems, like pollution by small government run enterprises and the like.

There are several newspapers specializing on the coverage of environmental matters. There is China Environment News issued by SEPA since 1984. It publishes environmental laws and legislation as well as a range of topics such as literature, education and technology. Furthermore there is the China Green Times by the Forestry Bureau. Besides those there are papers that cover environmental matters in a special column, like the China Youth Daily or the Business Daily.

Movies contribute to a great extent to the spreading of environmental education and consciousness. On a film festival in Beijing in 2001 the German Ökomedia Company presented some films on international environmental problems that were well received. The event was sponsored by the China Forum of Environmental Journalists and by EETPC. Such festivals are drawn up, to provide Chinese journalists and filmmakers with a window to the world and to encourage them to take alike action.[109]

The Internet has also become an important platform for the exchange of the various players in the field of environmental protection and education. Most NGOs and groups have their own website where they provide information in Chinese and in English. The

[108] www.eetpc.org\library.htm.
[109] Sayers, Sternfeld, *Berliner China Hefte* 21 (2001), p. 53.

Internet is further used to spread news in newsletters and in chat corners where messages can be posted to the people logged in. Like that the Internet as a media contributes to the dissemination of knowledge and know-how concerning environmental education.

7. Feasibility Analysis

To allow an insight into the situation of EE in China, the previous chapters have lined out the educational system, the problems and achievements of EE, the needs of schools and the actors in the field. This information is the basis for understanding the special situation of EE in China. Furthermore, the previous chapters provide the reader with the background knowledge for the following two chapters. The first one will discuss the feasibility of adapting the German 'Tamaki Foundation Project on Environmental Education' to China. The second chapter provides possible partners as well as proposals for different project designs of a Chinese project on Environmental Education.

7.1. Short description of the German Tamaki Foundation Project on EE

The German Tamaki Foundation Project on EE has started off in February 2004 and runs till February 2005. The aim of the project is the dissemination of the results of the earlier 'Tamaki Foundation Project on Environmental Issues' to young people. By running an EE project in schools the Tamaki Foundation wants to contribute to the creation of awareness for global environmental problems among the younger generation. Content-wise the focus is therefore on global environmental issues and the interrelationship between them. The project's contents will be handed down to the schools with the help of the Ministries of Education by including them into the curriculum. In order to endow teachers and students with the means to run such a curriculum, the German project provides a video, classroom materials, a CD ROM with additional information, a computer game and a website on global environmental issues.

7.2. Feasibility of adapting the German project

When the idea of extending the German Tamaki Foundation Project to China was discussed first, the question of adaptation was raised. How much and in what way would the German Project have to be adapted?

Soon after beginning the research in China it became clear, that the situation of EE in Germany and in China is very different from one another. This difference is reflected in:

- The level of EE, meaning the teaching methods and contents and
- in the degree of the distribution of EE, meaning its dissemination and implementation.

These aspects of EE determine the contents taught to the students on the one hand and the concept of how and where to implement a project on the other hand.

Therefore the question of adaptation of the German project as such fell into two parts:

- How to adapt the contents and
- how to adapt its concept of implementation

to the Chinese conditions.

7.2.1. Adaptability of contents

The German project aims at teaching students more about the global intertwinements of environmental issues. Although the contents refer to global situations, they are described from a German point of view. So at first, it was clear that to adapt the contents to China, this viewpoint had to become 'Chinese'.

To make the contents 'Chinese' would basically mean to teach global environmental issues to the students, but seen from the Chinese ankle. To teach Chinese students on global issues only makes sense under one precondition: the level of knowledge on environmental matters among students and teachers is similar to the level in Germany.

In Germany, each of the 16 federal states is responsible for the implementation of educational matters within its borders. Generally speaking, EE has been included in the curricula from the beginning of the 1980s. From then on, environmental issues were taught to students in primary and secondary school. The teachers learned about the hard facts of EE in in-job training courses. Like that, education on environmental matters became standard school knowledge in comparably short time. Furthermore the tradition of partaking-teaching, which helps to build up the student's environmental awareness, is quite a long one. So both the level of knowledge of environmental matters and of pedagogies is relatively advanced. Therefore the needs of German schools in EE range on a different level and are structured differently from those of schools in a country where EE is just about to take hold in the curricula. The strong basis of knowledge on local environmental issues demands the introduction of global aspects into German classes.

In contrast to this, the strong basis of knowledge on local environmental problems still needs to be built up in China. Due to the culturally different teaching methods, the pedagogical aspect in EE also needs to be strengthened in China at the same time.[110]

As a result of this, there are two choices concerning the adaptation of the German contents:

1. Modify the contents in a way that the global environmental problems are shown from the viewpoint of China. That would mean to replace all German figures, pictures and other references with China specific data. This kind of material would best be used by schools that are already very advanced in EE, like schools taking part in the *GLOBE* program or selected Green Schools.[111] Other schools just have a very different needs profile. They would have to try to bring the adapted material in line with their existing level of EE. This might prove to be a very difficult if not impossible task for the teachers.
2. The contents of the German project are not used for China. Instead, new teaching material would be designed and written up. This could be done for a specific type of school (primary, secondary, vocational) in a certain geographic location (city-near, countryside). This approach is more costly but guarantees a higher impact on the promotion and dissemination of EE. It would be tailored to the current needs of Chinese schools and incorporate the Chinese (cultural) approach to the topic. All Chinese schools in the target area could use the material.[112]

Depending on the intention both options will help to promote EE in China. The first will help to promote the knowledge on global environmental problems. The target group for this alternative is relatively small. The choice of geographic area is limited to the big cities. As a result, the costs for this alternative will be comparatively low.

The second alternative will help to foster EE in China in accordance with the present Chinese system. It will help to satisfy demands and balance deficits. Accordingly, the target group for this approach is rather extended. The geographic area can both be city-near or countryside areas. As a result, this project would demand a larger financial commitment.

[110] For a detailed description of needs please refer to section 5.
[111] For more information on the *GLOBE* program and Green Schools please refer to section 6.2. and 6.1.1.
[112] Concerning the choice of possible partners please refer to section 7.2. Different project outlines are described there.

7.2.2. Adaptability of the concept

The concept of the German project can be seen to consist of two levels:

- On the *meta level* it is about how to spread the whole project as such in the educational system.
- On the *project level* it is about through which means of pedagogies the contents of the project are spread in class.

The German project intends a distribution with the help of the Ministries of Education of the respective federal states. The contents of the project will be spread in the schools by the means of different media. These include printed material, a CD ROM, a film on VHS/ DVD, a computer game and a website.

An adaptation of the German concept to China on the meta level is only possible under the precondition that the educational system and the pedagogical conditions are somewhat similar.

7.2.2.1. <u>The concept on the meta level (system)</u>

As for the educational system, it has been shown above that the centralism in the Chinese educational system is about to be abolished in favor of a decentralized structure. So on the surface, it seems to draw closer to the German model of a decentralized education. Despite this, it has been pointed out earlier that EE is not spread systematically through the Chinese system.

The German top-down approach, from the ministry to the schools, ensures that EE is taught in class. In contrary to this, the top-down approach in China ensures that EE is included in the curricula of schools but does *not* make sure that it is taught in class. Where the system ensures the implementation of EE in Germany, it is the teacher's personal preference that determines the implementation of EE in China.

Accordingly, a project in China could be spread through two ways:

1. It can take the way through the MoE downwards to the schools or
2. It is implemented with the help of a partner with good contacts both to the MoE and to local schools.

The first alternative is appropriate for projects that have a long-term aim, like the incorporation of certain regulations or proceedings into the nation-wide curricula. Projects of this kind will take more time because of the bureaucratic proceedings. It will also not be easy to predict the outcome, nor to ensure the implementation in place later.

The second alternative is appropriate for projects that try to improve existing structures or areas and where no additional administrative decisions on national level are necessary. With a suitable partner these projects will show quicker results. The implementation can be closely monitored. Accordingly, the project will not be nation-wide in the first place, but would have to be spread from a pilot area.

As a result of interviews with experts, studying the literature and a general experience with the mentality of the Chinese people, the author suggests the second alternative. It is more appropriate for projects on EE because they aim at implementing or improving existing regulations and structures.

There are several partners available that have already gained experience with the existing regulations and are familiar with the Chinese way of implementing those. This approach will therefore minimize administrative time lags and detours. The partners have access to networks of people that will help to facilitate the implementation of the project. A direct access to the 'real' implementers of EE, the teachers, guarantees a high efficiency through shorter ways of communication. It also fits the tendency to advance matters in China: It is easier to act through networks of people than through the (political) system.

7.2.2.2. The concept on project level (media)

For an adaptability of the German project to China, the level of pedagogies and the way of teaching should be similar. It has been shown in detail, that this is not the case yet. Despite this, it is possible to spread the knowledge through the same media as in Germany if they are adjusted. The different media and their adjustments for China:

- *Printed materials:*

Books are the best way of spreading knowledge in Chinese schools. A book does not depend on technical equipment for use. Books are the traditional means of learning in China, a habit which to change cannot be the aim of a project on EE.

Concerning the books, it is necessary to create not only a student volume but also a teacher volume. In contrast to Germany, the teachers might not have the time and the means to access the background information of the topics treated in the student volume. The teacher volume needs to contain the hard facts on environmental issues as the basis of knowledge is very different among teachers. Even more important is to line out pedagogical approaches on how to impart the topics to the students. The teacher volume

could be produced on CD only if the project was implemented in the large cities. Others schools might lack the technical equipment.

- *CDs:*

The idea in the German project to provide further information and background knowledge on one or more CDs is very appropriate for China. If the project was implemented in rural areas only, the CD's content would have to be provided in printed form also. The CD could contain parts of the teacher volume for print out and background information like a dictionary on environmental terms and reference material. There are no restrictions or adjustments necessary in technical respect.

- *Film:*

As for the use of a film to illustrate the teachings, it should be in the VCD or DVD - format to ensure its usability. The medium is not very suitable for a remote area project. The schools in those areas lack the technical equipment. The film should generally aim at showing the interrelationship between environmental problems, either local (China) or global (earth) ones. Currently, the Chinese public/ students know about specific environmental problems. Nevertheless it is rare to find information about the interdependencies between these issues and their consequences. To strengthen the consciousness about the interdependencies is a basis for the creation of responsible, environmentally aware students. A film is a very appropriate means for that.

- *Computer game:*

As to the author's current knowledge, the technical adjustments of a computer game are easy to achieve. Such a game is most suitable for a city or city-near schools project. It will help the students to gain knowledge on environmental issues while playing. By the means of rewarding environmentally friendly behavior in games it encourages the students to adopt the same behavior in real life. In the respect of connecting school knowledge with real life the Chinese educational has a deficit. A computer game could significantly alter this situation. Furthermore, computer games are very popular among city youth.

- *Website:*

The establishment of a website is a good means to provide room for communication both among teachers and among students. The Chinese version should provide a rather large section for the teachers. It should provide them with updates on case studies and have a chat room for the exchange of experience with others. A 'pin board' where to

post the own experience in written form will create a helpful database of knowledge. For regular information, a newsletter service should be established. It should be provided in printed form also, if the project was to include non-city area schools as most of them do not have stable internet access. Basically, there are no technical adjustments to be made.

- *Teacher training:*

Teacher training courses are not provided for in the German project as they are not needed very much. For China, teacher training is a means to make sure that the implementation of the project will run smoothly. Teacher training has to be part of every project on EE in China. It will provide the teachers with the knowledge on how to employ the materials, let them understand the contents and provide training in teaching methods. In China, personal relationships are in a very high esteem. So the workshops provide the indispensable platform for the teachers to get in contact with each other. Workshops will therefore ensure the quality of the project and contribute to the project's sustainability: The network of people will further exist and encourage others to join in on EE even if the original project has already ended.

7.2.3. Conclusion

The analysis above has shown that the German 'Tamaki Foundation Project on Environmental Education' can be adapted to China as far as it concerns the concept. The insight into the situation of EE in China has revealed that an adaptation of the contents of the German project would be also possible within limits.

The most 'demand-oriented' way is to develop new contents for EE in Chinese schools. The two alternatives basically differ in time and financial commitment.[113] But both of them demand excellent local partners. Some possible partners for the implementation of a project in the area of EE are presented in the following chapter.

7.3. Possible project partners

In the course of the field study, several potential partners have been identified in the area of Beijing. This does not mean that the project area needs to be Beijing. All of the partners mentioned are working both inside and outside of the capital. They are the suitable partners both for adapting the German contents and for setting up completely new materials. They all fulfill the following, important criteria:

[113] For a comparison in time and costs of different project settings please refer to section 7.4.

- They are experts in the field of EE.
- They have experience with international project partners.
- They have a good relationship with the MoE and are in contact with a network of schools.
- They are dedicated to spreading EE in China.

For the different media, different partners have been found. Each of them has a special expertise in producing one or more media.

- *Books:*

The teacher's volume should contain examples for experiments and games connected to environmental issues. It should also include very detailed instructions on how to teach them. This demands a partner with both expertise in environmental matters and pedagogies.

Possible partners for writing up/ adapting of textbooks are:

1. Beijing Normal University, Environmental Education Center & Department of Geography, Prof. HUANG Yu.

The Beijing Normal University is directly under the administration of the MoE. Its members are in close contact with the ministry. The university provides the scientific background for the MoEs regulations and writes up materials for their implementation. The Environmental Education Center was set up in the department of Geography in the course of a project. Since its establishment the center is very active in issuing material on EE, textbooks as well as workshop materials. Prof. Huang is an expert in EE who has written numerous essays and books.[114] He is in contact with schools in Beijing and elsewhere that are rather advanced in EE. BNU would be the suitable partner for a project with city schools.

2. Center for Environmental Education and Communication (CEEC) of SEPA, Mr. ZENG Hongying.

The CEEC is the unit of SEPA responsible for spreading EE in public and in schools. It is the nation-wide leader for implementing SEPA's regulations. It coordinates the *GLOBE* school program and monitors the Green School program. A reference center, the CESDRRC, a bookshop with environmental literature and facilities to shoot films make CEEC a universal project partner.

[114] Please refer to the bibliography.

CEEC's textbook working group has published textbooks for EE earlier.[115] As they belong to a ministry (SEPA), the relationship to MoE is good. Mr. Zeng, coordinator of the Green School program, has an excellent network of schools on various levels of EE and in various locations all over China.

The CEEC as part of a ministry would be an ideal coordinator for several project partners. One of CEEC's task is to coordinate international projects in the field of EE.

3. Friends of Nature (FON), Beijing, Ms. ZHANG Hehe.

The NGO 'Friends of Nature' is active to promote EE in rural areas. A team of FON has published a handbook on the contents and methods of EE.[116] They would like to prepare a series of textbooks with rural background. FON is an ideal partner for a project implemented in rural areas, where they have good connections to local schools in certain areas.

Ms. Zhang is a teacher herself. She is the project officer for projects in the rural areas.

- *CDs:*

The CDs with background material (compare above) should best be written up with the partner responsible for the creation of the textbooks. This will ensure the correspondence between the materials.

- *Film:*

A film on environmental issues could be made to consist of several sequences each presenting a different ankle of one issue. Another possibility is to cut a film to consist of a number of different environmental issues (compare above). The following organizations could act as partners:

1. TVE, Beijing

For details to TVE please refer to section 6.4.1. TVE hosts a library of over 150 films in Chinese, among them films on global environmental issues. The organization has produced also films about the Chinese environment. Most of the films are distributed freely through a network of government contacts. TVE is very established and knowledgeable in the field.

2. Environmental Education Media Project for China (EEMPC), Beijing, Mr. John Liu.

The Environmental Education Media Project is a non-profit organization. Its mission includes delivering environmental education materials to Asian countries. EEMPC aims

[115] Please refer to the bibliography.
[116] The Handbook Editing Group of Friends of Nature (2004).

at raising the level of public awareness and appreciation of global and local environmental issues. It is committed to environmental education and increasing awareness among masses on the issues of environmental protection and sustainable resource use. [117] The organization has produced several films to document environmental issues in Asia. Mr. Liu is the director of the organization.

In case of choosing these organizations as a partner for cutting a film, copyrights are mostly cleared. All of them have a quantity of own productions on environmental issues they could use to cut a new film. They are also the appropriate partners to shoot an entirely new film on environmental issues.

- *Computer game/ website:*

As pointed out in the German project, a computer game should strengthen the team spirit of the students. In China it would be particularly important that it also boosts the student's environmental awareness.

To program a multi-faceted and pedagogically sound computer game is a huge task. It takes several years to get to a fully developed and approved version. In the course of research a Chinese company or organization with both experience in EE and programming has not been found. But it is not necessary to start over from scratch. The following company is about to launch a computer game on environmental issues:

> Sustain Ability, Camberwell, Australia, Ms. Jane Steward in cooperation with CEEC of SEPA.

"Sustain Ability is an Australian company specialized in programming computer games and websites on environmental issues. We launched our company with the release of a children's series of interactive environmental education programs based on a character called Ollie. These programs are CD ROM based with a connection to an associated web site. They provide children as well as their teachers, community leaders and parents with a tool for understanding the key environmental issues of our day."[118]

The company finances itself through sponsors. These sponsors can be NGOs, foundations, environmental organizations, political bodies and companies. The sponsors can within limits determine the contents of the computer game. Sustain Ability has issued several CDs with computer games on recycling, water and on global issues. The games are linked to websites, where contact and more interactive features are available. The game CD contains a large section with teacher materials and background

[117] http://www.eempc.org/Downloads/EEMP%20Brochure.pdf.
[118] http://www.sustain-ability-int.com/html/who.html.

information. The latest CD is called 'Ollie saves the planet' and aims at making children understand the interactions of global environment. The company has adapted the Australian version to America, England and the Emirates. Now they are about to adapt the version to China, where Sustain Ability has partnered with CEEC of SEPA. The discussions on the adaptation of contents are about to start. The company and CEEC welcome new partners/ sponsors to join in. Ms. Jane Steward is one of the directors of the company.

- *Teacher training:*

Teacher training should be one of the central items in any project on EE. The training should be done in workshops lasting for a 2-3 days, best on weekends. The workshops could be held in schools and for the teachers of a certain geographical area. There are several possible partners for teacher training:

1. Teacher-training Center of Beijing Normal University (BNU).

The teacher-training center at BNU has a long experience in training teachers in EE. They are experienced in training both teachers from cities and rural areas. (For more details on BNU, please see above 'books').

2. CEEC of SEPA

CEEC of SEPA mostly organizes teacher-training workshops for teachers of Green Schools. It would be possible to set up a new teacher-training class with their help. CEEC's strength is the dense network of teachers and school they are in contact with.

3. FON

FON mostly organizes teacher training for teachers from remote or poor areas. The training is then done in the course of a visit to a rural school with a time schedule of 2-3 days. FON also organizes for teachers to come to Beijing for training.

7.4. Outlines of possible projects

The needs analysis has identified needs of three types of schools: city schools, city-near/ well to do countryside schools and remote/ poor area schools. Even though their needs were very different in detail, some general deficits in Chinese EE were found. There is a general lack in teacher-training and comprehensive teaching materials. The feasibility analysis showed that the German teaching materials could be adapted to China only for the city schools. For the other types of schools new material has to be written up. Due to their lack of technical equipment the mix of media for EE has to be adapted.

These findings indicate that there are several possible projects that differ in their aims, their target group (= geographical reach) and their costs accordingly:

1. A project with adapted German material for city *GLOBE* schools (the 'global EE project').
2. A project with newly written material for either city schools *or* city-near/countryside schools with the German media mix (the 'local EE project').
3. A project with newly written material for remote area schools with an adapted media mix (the 'develop EE project').
4. A low budget project for city schools or city-near/countryside schools that provides teacher-training and a website while using already available media.

These project settings will be compared according to their aims, the geographical reach, the media mix, the costs and their timeframe. A graph with an outline of the project is given.[119]

7.4.1. The 'global EE project'

The aims of the global EE project are:

- Adapt the materials developed in Germany.
- Spread the knowledge on global environmental problems among Chinese students in the cities.
- Concentrate on the needs of schools advanced in EE.

The geographical reach of the global EE project is:

- Limited to the cities like Beijing, Shanghai, Nanjing, Guangzhou and Xiamen.

[119] The project outlines apply under the following preconditions: 1. The sponsor has decided the implementation of one of the projects and provides the financing. 2. A project team has been set up. 3. The responsible member of the project team is in China. For detailed assumptions please refer to figure 6 in the appendix.

- Limited to approx. 60-70 schools (*GLOBE* schools) in total.[120]

The media for the global EE project are:

- *Books*: a printed students volume and a teachers volume. The teacher volume either printed or on CD. Both volumes adapted from the German materials.
- A *Film* that shows the interaction of global environmental issues.
- A *Computer game* that teaches the students their responsibility within global environmental protection.
- A *Website* that serves as a link between the partaking schools and transmitter of information.
- *Teacher-training* that makes the teachers familiar with the materials. Pedagogical aspects do not have to be the center of training in schools already that experienced in EE. Provide 3 units of teacher training.

The costs of the global EE project are:

- In total approx. 130,000 EUR.

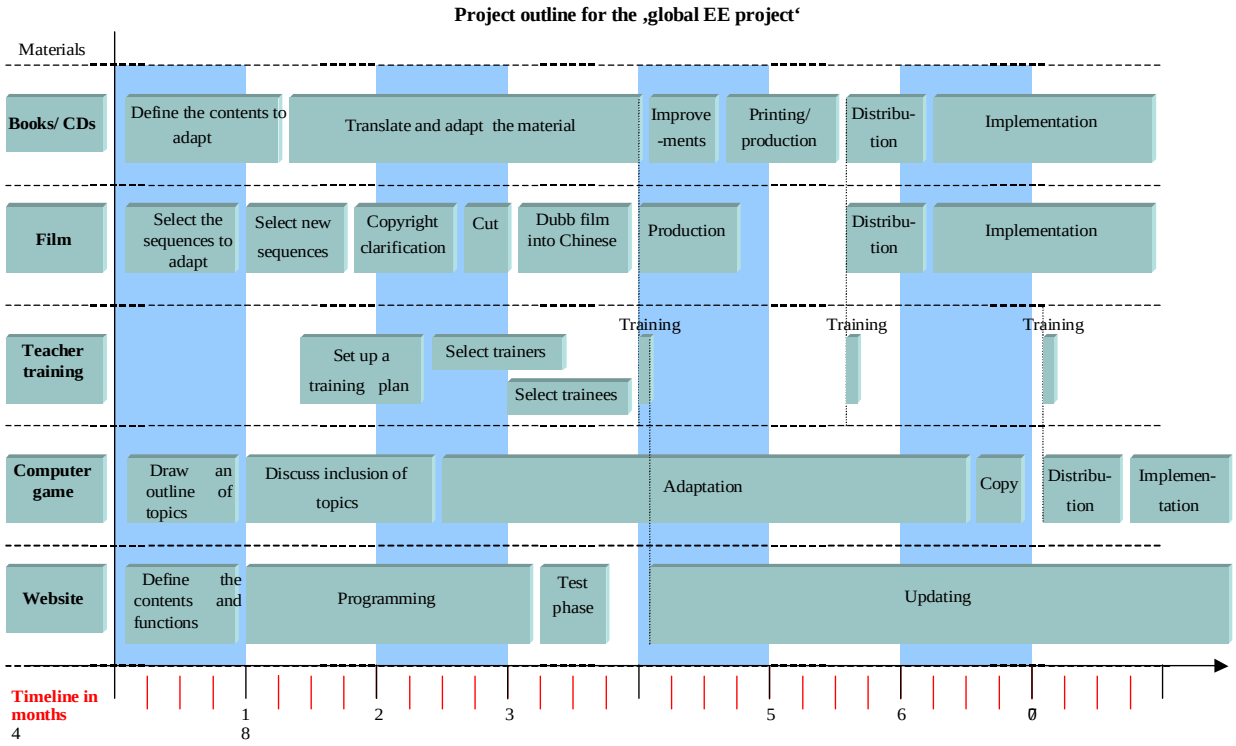
The timeframe for the global EE project is:

- In total approx. 10 months:
- Calculating a 3 months preparation phase.
- Approx. 7 months till the materials are implemented in schools and the teacher training is completed.[121]

An outline of the project and its tasks is depicted below.

(The vertical lines signify: no start of task no. 2 without the completion of task no. 1).

[120] For an overview over the *GLOBE* schools in China please refer to www.globe.gov/fsl/html/templ_airlie1997.cgi?rep_cn.
[121] For an enlarged version of the graph please refer to figure 7 in the appendix.



7.4.2. The ‘local EE project’

The aims of the local EE project are:

- Design new materials that are tailored to the needs of Chinese schools.
- Spread knowledge on Chinese environmental problems among students in China.
- Help to boost a new understanding of teaching in EE.

The geographical reach of the local EE project is:

- Either average city or city-near countryside schools.
- Limited to a project area but can be spread to alike types of schools later.

The media for the local EE project are:

- *Books* that are newly written up and provide students and teachers with a basis for the teachings in class.
- A *CD* for the teachers with the background information on the lessons and environmental issues.
- A *Film* that shows the interaction of Chinese environmental issues.
- A *Computer game* that teaches the students their responsibility within environmental protection.

- A *Website* that serves as a link between the partaking schools and as a transmitter of information.
- *Teacher-training* that makes the teachers familiar with the materials and new pedagogical approaches. Provide 4-5 units of teacher training according to the level of EE in the locality.

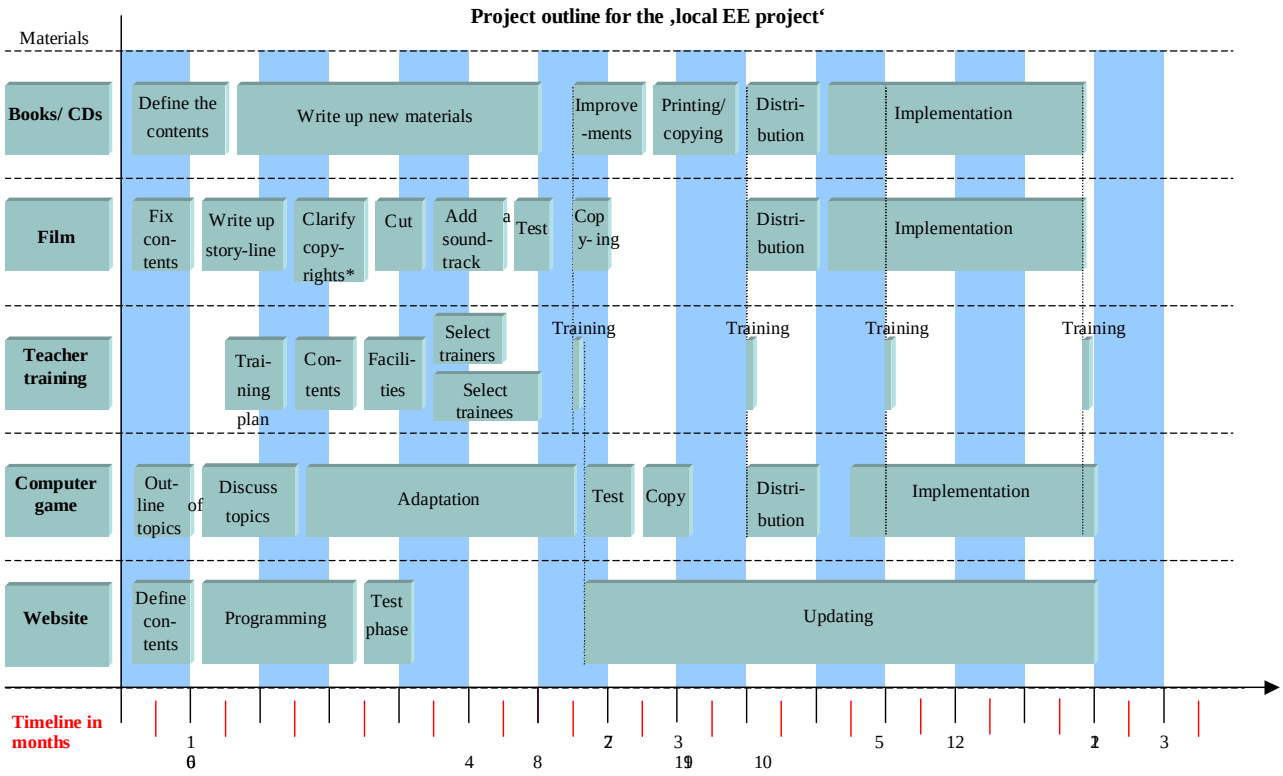
The costs of the local EE project are:

- In total approx. 119,000 EUR.

The timeframe for the local EE project is:

- In total 14 (18) months:
- Calculating a 4 months preparation phase.
- Approx. 10 months till the materials are completed and implemented in school with an additional time span of 4 months till the teacher training is completed.

An outline of the project and its tasks is shown below.[122]



*if the sequences are chosen from the libraries of the partners copyright clarification will not be needed.

[122] For an enlarged version of the graph please refer to figure 8 in the appendix.

7.4.3. The 'develop EE project'

The aims of the develop EE project are:

- Create materials on EE that fit the needs of rural areas.
- Promote and advance EE in remote/ rural areas.

The geographical reach of the develop EE project is:

- Schools in remote/ rural areas.
- To be spread from a limited project area to other schools of the same type.

The media for the develop EE project are:

- *Books* on EE with a rural background both for teachers and students as indispensable source of information that does not depend on technical equipment. Special attention has to be paid to the pedagogical outlines in the teacher volume.
- A *CD* with background information for the teachers.
- A *postal newsletter* as a replacement for the website.
- *Teacher-training* that introduces the contents and the use of the materials to the teachers. Provide 5-6 units of teacher-training best to be held in the area. A special focus should be on the teaching methods in EE. The timetable for the teacher training should ensure a long-term monitoring of the teachers.

The costs for the develop EE project are:

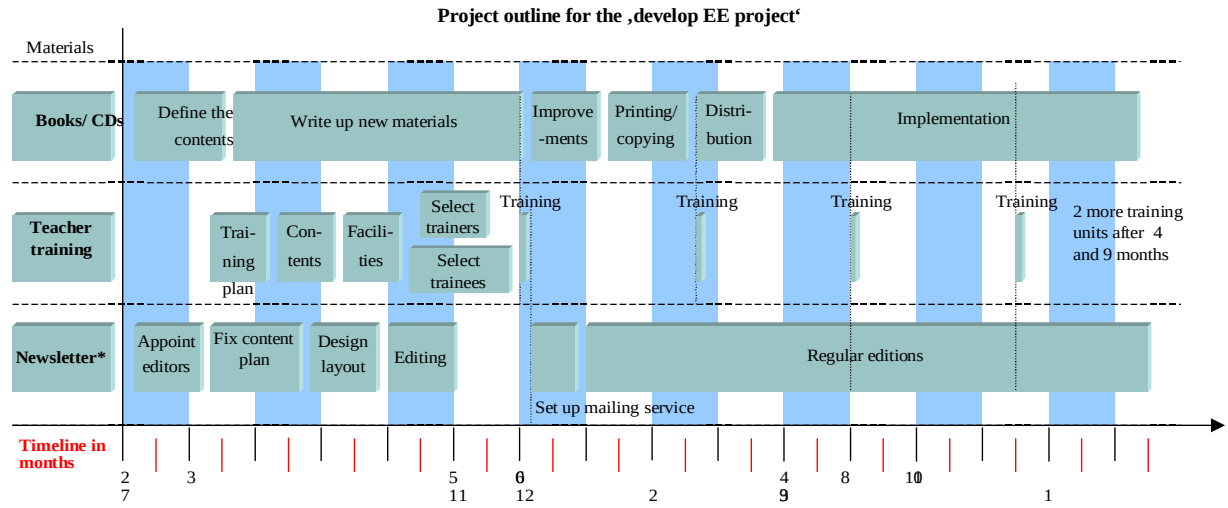
- In total approx. 63,000 EUR.

The timeframe for the develop EE project is:

- In total approx. 12,5 (22,5) months:
- Calculating a 3 months preparation phase.
- 9,5 months till the materials are implemented in the schools. The teacher training will be completed only after additional 13 months.

An outline of the project's tasks is depicted in the graph:[123]

[123] For an enlarged version of the graph please refer to figure 9 in the appendix.



*The newsletter service is provided by the partner writing and editing the books.

7.4.4. The ‘low budget project’

The aim of the low budget project is:

- Boost EE in city schools and city-near countryside schools.
- Make use of the materials already in place.
- Achieve quick results through teacher training at a low budget.

The geographical reach of the low budget project is:

- Compare the *‘local EE project’*. The

media for the low budget project are:

- *Books* and *films* that are already available in China. [124]
- A *website* for the interaction of the teachers.
- A *teacher training* that aims at strengthening the work with existing materials through a concentration on the teaching methods.

The costs for the low budget project are:

- In total approx. 43,000 EUR.

The timeframe for the low budget project is:

- 15 months with a suggested schedule of training units hold every 3 months, 5 training units in total. Like this, a long-term teaching in EE can be made sure.[125]

[124] For a list of teaching materials that could be used during such a project, please refer to the bibliography ‘teaching materials’. A list of films on Chinese environmental issues is available from http://www.eetpc.org/.

[125] There is no specific graph for this project outline as the time schedule involves only teacher training and the setting up of a website.

7.4.5. Conclusion

The graphs depicted above show roughly what tasks will have to be realized for the implementation of a project. It is not the aim of this study to provide exact project plans for the different project proposals, but to provide a guideline for decision. At the beginning of the field study the goal was to provide an evaluation of all media and their usability in China. Further research has brought to light, that within a city like Beijing, various levels in EE and various systems of teaching exist next to one another. It is a special characteristic of the Chinese culture to possess and unite the most contradicting facts and situations. Accordingly, it did no longer seem appropriate to analyze only the usability of the media or the German concept in respect to the Chinese reality. So instead of categorizing according to media and then split these categories to suit the different situations in China, the approach has been reversed.

This has the advantage that the numerous Chinese realities can be depicted as categories of schools. This allows to derive their specific needs and to make up project settings that fit to their needs.

8. Closing remarks

This study evaluated the influence of the Chinese conditions on the implementation of projects in the area of EE. It also showed how and where the German EE strategy could be adapted.

In China, there still is a struggle to unify both the structures and the implementation of EE. Generalized approaches or projects in this area are therefore not appropriate at this stage. Neither can one rely on the political or educational system to implement projects through it. Resulting from this, project implementation demands a Chinese partner who is an expert of EE with knowledge about the actual situation and a good network.

EE is a comparatively new topic and in most areas still in its beginnings. So projects will meet fragments of EE and incomplete structures both for the dissemination of information and the implementation of EE. Accordingly, projects need to be specialized on their target area's needs. This ensures an 'organic' growth and a dissemination of EE that fits the Chinese conditions ideally. Such a project will therefore contribute to a long-term spreading of EE.

Any project in the educational field consists of the three main aspects of 'contents', 'methods' and 'dissemination'. Also in this respect the project needs to suit the external

conditions. These are represented by the political/ educational system, the mentality and the geographical location. Generally speaking, the contents of a project are determined by the political/ educational system in the first place. It sets the framework of possible contents on a large scale, whereas the actual 'is-situation' in place dictates the contents on a smaller scale. The mentality of replacing system with networks of people will determine the methods used in a project. On a Meta level this will be about how to approach the implementation, whereas on the project level it is about how to teach the contents. The dissemination of a project in the sense of where to carry it out is generally determined by the geographical location. In a huge, non- homogeneous country like China there is an ever-widening gap between city and countryside areas. The differences in living conditions, awareness and equipment cannot be bridged by one project approach. Again, a project has to choose one area for dissemination.

While the conditions for projects on EE are rather complex, there is a growing demand for EE. In this sense, the lack of structures and the diversity of target areas ensure that any project no matter on which scale will contribute enormously to the development of EE in China.

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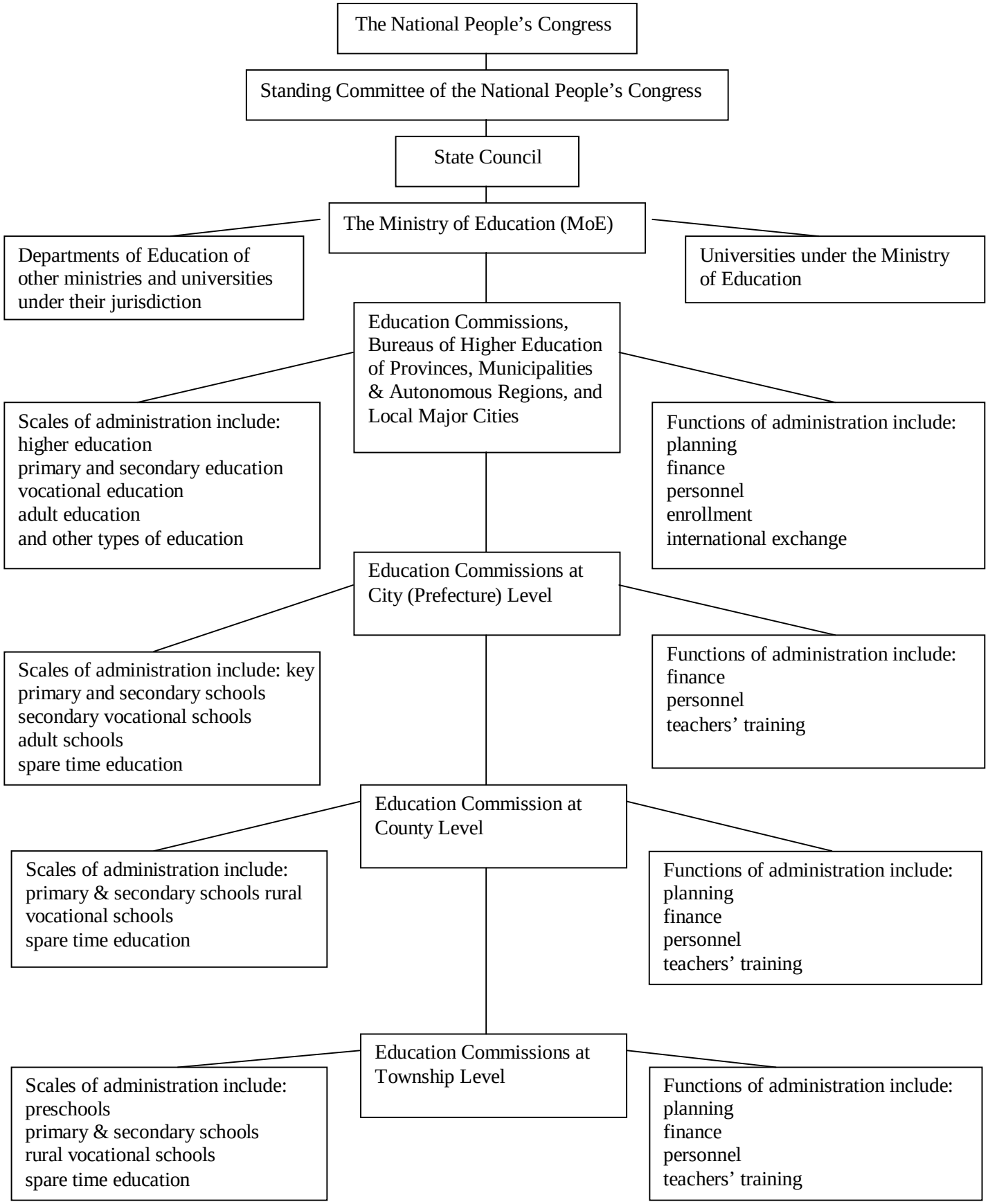
Figure 1. Outline of the administrative structure of education in China.



After: Wang (2003: 26).

Figure 2. An overview of the subjects taught in primary and secondary schools.

Table 6.2
Year 2000 Chinese Primary and Secondary Education Subjects

	State Arranged Subjects	*Locally Arranged Subjects*
Grade 1	Chinese, Mathematics, Nature, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics.
Grade 2	Chinese, Mathematics, Nature, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics.
Grade 3	Chinese, Mathematics, Nature, Social Studies, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics, Popular Science and Technology.
Grade 4	Chinese, Mathematics, English, Nature, Social Studies, Local Community Studies, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics, Popular Science and Technology.
Grade 5	Chinese, Mathematics, English, Nature, Social Studies, Information Technology, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics, Popular Science and Technology.
Grade 6	Chinese, Algebra, English, Chinese History, Local History, Geography, Fine Arts, Music, Moral Character.	Practical Chinese, Creative Mathematics.
Grade 7	Chinese, Algebra, Geometry, English, Chinese History, Geography, Biology, Fine Arts, Music, Politics, Information Technology, Work Skills, Physical Education.	Practical Chinese, Creative Mathematics, Popular Science and Technology.
Grade 8	Chinese, Algebra, Geometry, English, World History, Physics, Chemistry, Biology, Fine Arts, Music, Politics, Work Skills, Physical Education.	Practical Chinese, Creative Mathematics, Popular Science and Technology.
Grade 9	Chinese, Algebra, Geometry, English, World History, Physics, Chemistry, Fine Arts, Music, Politics, Work Skills, Physical Education.	Practical Chinese, Creative Mathematics.
Grade 10	Chinese, Ancient Chinese Poetry, Mathematics, English, Modern Chinese History, Geography, Physics, Chemistry, Fine Arts, Music, Politics, Work Skills, Physical Education, Information Technology.	Determinant and Matrix, Physics Laws and Research Method, Balance in Chemistry, English Typing Skills, Electronic Creative Making Skills, Electrical Engineering Skills, Electric Motor Installation and Operation Skills, Gardening Skills, Sewing and Tailoring Skills.

Grade 11	Chinese, Ancient Chinese Prose, Mathematics, English, Modern World History, Geography, Physics, Chemistry, Biology, Politics, Work Skills, Physical Education.	Subjects are the same with Grade 10, but at higher level of training.
Grade 12	Chinese, Contemporary Chinese Literature, Mathematics, English, Ancient Chinese History, Geography, Physics, Chemistry, Biology, Politics, Work Skills, Physical Education.	Subjects are the same with Grade 11, but at higher level of training.

Source: Tianjin Municipal Education Commission, *The 2000 Chinese Primary and Secondary Education Subjects* (2000:March & April).

Source: Wang (2003: 126).

Figure 3. Selected Contents of Teacher Materials for Environmental Education

1.
'New Century Primary School Environmental Education' Working Group „新世纪小学环境教育" 编写组, *Lüse yaolan congshu* 绿色摇篮丛书. *Huanjing jiaoyu jiaoshi yongshu 1-6 ce* 环境教育教师用书 *1-6* 册 [Green Cradle Series. Guidebook for Teachers of Environmental Education Part 1-6]. Beijing: Qixiang Press 1999.

Number of copies: 3,500
Price: 15 Yuan
ISBN 7-5029-2821-9/G 0872

Content:
- Instructions for teachers.
- Different activities to strengthen the environmental awareness of students.
- Methods of explaining environmental problems.

Very short instructions without illustrations, basic knowledge on EE needed.

2.
Beijing Normal University 北京师范大学, Huadong Normal University 华东师范大学, Xi'nan Normal University 西南师范大学 Environmental Education Centers 环境教育中心, *Kechixu fazhan jiaoyu. Jiaoshi peixun shouce* 可特续发展教育。教师培训手册 [Sustainable Development Education. A Reference Book for the Formation of Teachers]. Beijing: Beijing Normal University Press 1999.

Number of copies: 3,100
Price: 25 Yuan, sponsored by the MoE, the WWF, BP Amoco.
ISBN: 7-303-05054-x/g 3590

Content:
- The only choice for the future of mankind is sustainable development.
- Strategies of sustainable development and their challenges for EE.
- The reaction of pedagogies towards sustainability: sustainability education.

- The most important method of sustainability education: the analytical approach.
- The target of sustainability education is knowledge.
- „“ is ability.
- „“ is a feeling of esteem.
- Sustainable education in school: the setup of Green Schools.
- A judgment on sustainable education.

Few illustrations, few model handouts, but very detailed working instructions, abundant background information and backup literature.

3.
Fang Xiqi 方修琦, Meng Zhehong 盟哲虹, Wang Yanjin 王燕津, *Quanguo zhong xiao xue jiaoshi jixu jiaoyu jiaocai* 全国中小学教师继续教育教材 [Nation-wide Teaching Materials on Progressive Pedagogies for Teachers in Primary and Secondary School]. Beijing: Huaxia Press 2001.

Number of copies: unknown
Price: 9,2 Yuan
ISBN 7-5080-2380-3

Content:
- The nature of environmental problems and their development.
- The most important indicators for global environmental problems.
- Environmental problems and the human health.
- Overview over the development of the relationship between humans and natural environment.
- Information on EE including websites.

4.
Jiang Dongmei 姜冬梅, *Huanjing jiaoyu jiaoxue, fangfa ji yingyong* 环境教育教学，方法及应用 [Environmental Education Pedagogies, Methods and Applications]. Beijing: China Environmental Science Press 2002.

Number of copies: 3,000
Price: 20 RMB
ISBN 7-80163-405-5

Content:
- Overview of different methods of EE (games, story telling, role plays) with practical examples.
- Several projects in different areas of environmental protection and EE.
- The projects are separated according to primary and secondary school level.

Documentation is very detailed, contains photos and is very practicable.

5.
Lin Peiying 林培英, Yang Guodong 杨国栋, Pan Shumin 潘淑敏, *Breaking new ground: case studies in environmental issues. Huanjing wenti anlie jiaocheng* 环境问题安列教程. Beijing: China Environmental Science Press 2002.

Number of copies: 5,000
Price: 28 RMB
ISBN 7-80163-322-9
(Global Environmental Alliance China GEA China, inspired by EETPC)

Content:

- Introduction into general environmental problems and aspects of EE.
- Case studies on specific environmental problems: overpopulation, climate change, ozone hole, water shortage, environmental problems in Western China, preservation of forests, preservation of species variety, environmental degradation in the province of Chongqing, water pollution of rivers and lakes, employment of DDT, waste-, plastic-, noise pollution, ecological farming, clean production, green costs (public transport), ecological tourism, sustainable development.

Very scientific, richly illustrated, abundant reference material.

6.

Center for Environmental Education Communication (CEEC) of SEPA 国家环境保护总局宣传教育中心, *Lüse yaolan congshu. Huanjing jiaoyu jiaoshi zhinan. Xiao xue huanjing jiaoyu huodong shili.* 绿色摇篮丛书环境教育教师指南小学环境教育活动实例 [The Green Cradle Book Series. Teacher's Guide in Environmental Education. Collection of Environmental Education Activities for Primary School]. Beijing: Lüxiang Publishing House 2000.

Number of copies: 2,500.
Price: 25 RMB
ISBN 7-5029-2767-0

Content:

- The basic knowledge of environmental science.
- Today's global environmental problems.
    a. The global climate change.
    b. The destruction of the ozone layer.
    c. Acid rain.
    d. Water shortage and water pollution.
    e. The extinction of species.
    f. Desertification.
    g. Diminution of the rain forest.
    h. The pollution of the oceans.
    i. Spreading of dangerous poisons.
- The Chinese environmental problems and the environmental management. a. The Chinese environmental problems:
    1. The deterioration of the environment results from the sudden economic development, the over usage of resources and the large number of huge building projects.
    2. The pollution of the environment results from the fact, that agriculture and cities distribute their waste into the environment.
        a. Ecological problems.
            i. Water and soil erosion.
            ii. Desertification.
            iii. Reduction of forest resources and the diminution of grasslands.
            iv. Lower harvests, degradation of soil quality.
            v. Diminution of species.
        b. Problems of environmental pollution.
            i. Air pollution and acid rain.
            ii. Water pollution and water shortage.
            iii. Pollution from solid particles and the waste problem.
            iv. Noise pollution.
- The Chinese environmental management.
- The Chinese environmental laws and regulations.
- The logic of the approaches to environmental protection.

- Environmental problems, sustainable development and environmental education.
- The relation between environmental problems and environmental education.
- Sustainable development and EE.
- Definitions, goals and schemes of EE.

7.
The Handbook Editing Group of Friends of Nature 自然之友志愿者手册编写协小组, *Huanjing jiaoyu zhiyuanzhe shouce* 环境教育志愿者手册 [Handbook for Volunteers in Environmental Education]. Beijing: 2004.

Content:
- Instruction for setting up classes on EE.
    a. In the open.
    b. In class.
    c. Observations, investigations.
    d. Observations of society.
    e. Environmental education in Australia.
- Topics:
    a. Erosion.
    b. A new view on environment – a change in awareness.
    c. Know/recognize animals and plant as well as their position in the food chain. d. Sorting refuse, effects of refuse on the environment.
    e. Creation of awareness, changing of awareness, encourage to take over responsibility.
    f. Desertification.
    g. Water pollution and its effects.
        i. In detail: pollution through solid waste (plastic).
        ii. Cleaning up waste activities.
        iii. Test the ph degree of the water.
        iv. Water supplies of the earth, separated according to its form of appearance (ground water, ice, oceans, atmospheric water).
        v. Usage of water.
    h. Water shortage (incl. the water supply available to China in relation to its population).
    i. Production facility: ‚Where can a steel plant be set up?' introduction to a project planning with regard to environmental factors.
    j. Marsh and migratory birds.
    k. Fertilizer, pesticides, insecticides, herbicides in agriculture.
    l. Danger of plastic pollution, problem of population growth, scarceness of resources.
- China's resources and the population pressure:
    a. Protection and use of resources
    b. Laws on environmental protection.
    c. Economize resources.
- Depiction of the value of natural resources:
- Empowerment of awareness.
- Experiments concerning the variety of species, the natural equilibrium.
- EE in Australia:
    a. The earth is a planet traveling through space.
    b. Construct a greenhouse in a bottle.
    c. Learn the pyramid of essential elements.
    d. Draw up your natural surroundings in a shoebox.
    e. Measure car exhaust fumes.
    f. Measure the air quality in your home.

Figure 4. A summary of the actual situation and needs of the schools in the 3 different areas.

	Is-situation	Needs (discernible)	Needs (unconscious)
Region 1: City schools	Long experience with EE. Progressive activities and involvement of public and parents. Financial and technical equipment on a high level.	New textbooks with fresh ideas. More interactions and workshops to boost environmental knowledge of teachers.	There are rarely any as the teachers and headmasters are well informed about the requests and their tasks.
Region 2: City-near/ well to do countryside	Good experience with EE. There is a standardized range of activities. The financial and technical equipment ranges from mediocre to good.	New textbooks that connect new pedagogies and EE. More teacher-training to spread the approaches and hard facts of EE.	In some places the requests of EE are misinterpreted to mean only the greenification of the school. A campaign on the real meaning of EE is needed.
Region 3: Remote/ poor areas	Short to no experience with EE. Activities are concentrated on the local flora and fauna. The financial and technical equipment is very limited.	Textbooks with rural background. Financial aid for purchases of equipment. Teacher-training in pedagogies and environmental issues.	In a lot of places there is a range of unconsciousness about the needs in EE. This is mostly due to a lack of information on the 'should-situation'.

Figure 5. Distribution of Green Schools in the People's Republic of China according to provinces and levels awarded.

No.	Province	Provincial level	Municipal level	District level	Sum
1	天津市 City of Tianjin	115	311	---[126]	426
2	江苏 Jiangsu	319	421	176	916
3	江西 Jiangxi	71	86	110	267
4	贵州 Guizhou	46	37	40	**123**
5	四川 Sichuan	46	430	519	**995**
6	山西 Shanxi	210	41	5	**256**
7	新疆 Xinjiang	68	81	143	**292**
8	湖北 Hubei	66	319	362	**747**
9	上海市 City of Shanghai	50	180	---	**230**
10	山东 Shandong	135	45	54	**234**
11	河北 Hebei	95	354	0	**449**
12	湖南 Hunan	71	229	368	**668**
13	内蒙古 Inner Mongolia	97	209	288	**594**
14	广东 Guangdong	266	917	1445	**2,628**
15	辽宁 Liaoning	114	84	7	**205**
16	浙江 Zhejiang	121	144	364	**629**
17	安徽 Anhui	61	301	146	**508**
18	黑龙江 Heilongjiang	217	526	156	**899**

[126] For cities there is no district level.

19	宁夏 Ningxia	33	15	0	**48**
20	重庆市 City of Chongqing	81	210	---	**291**
21	吉林 Jilin	155	387	0	**542**
22	陕西 Shenxi	71	269	215	**555**
23	北京市 City of Beijing	96	104	---	**200**
24	福建 Fujian	98	418	862	**1,378**
25	广西 Guangxi	180	620	116	**916**
26	青海 Qinghai	5	23	23	**51**
27	甘肃 Gansu	21	44	35	**100**
28	云南 Yunnan	114	394	720	**1,228**
29	河南 Henan	91	524	219	**834**
30	西藏 Tibet	8	0	0	**8**
31	海南 Hainan	23	0	0	**23**
In total		**3,144**	**7,723**	**6,373**	**17,240**

Source: Statistical Bureau of CEEC of SEPA. (30th of June 2004).

Source: Own creation.

Figure 6. Estimation of costs and assumptions for project proposals.

For the estimations of the costs for the proposed concepts, several assumptions had to be made. The basis for the estimations is information provided by some of the potential project partners. The general unwillingness to reveal any costs before setting up negotiations on the project implementation has limited the access to liable information considerably. This causes a probability that costs vary of approx. 10%.

General assumptions:

- In total there are 25 project schools.
- 1 coordinator per project.
- All costs are calculated in EURO (EUR).
- Average (Chinese) salary per month 10,000 RMB (1000 EUR).
- The expenses for and of the foreign project members are not included.
- The running costs of updating the website are included in the price.
- The materials provided are handed over to the next generation of students and teachers.
- 3 teachers per school receive training, in total 75 persons.
- A training unit arranged in proximity to the schools costs 80 EUR per person (including trainers, facilities, food).
- A training unit with overnight stays and travel expenses costs 200 EUR per person (including trainers, facilities, food).
- There are 12 teacher per school concerned with EE.
- The number of copies for the teacher volume is 300.
- The number of copies for the student volume is 3000.

The global EE project.

Assumptions.

- There are 3 units of teacher training, arranged in a location away from the schools (200 EUR/person).
- 40 students per class, 3 classes are provided with materials.
- Costs for adapting the books are equivalent to 3 persons working full time for 3 months.
- The coordinator accompanies the project for 7 months.

Costs.			
Books/ CD.			
Printing	3300 pcs	2,5 EUR/pc	8,250
CD	300 pcs	1,0 EUR/pc	300
Distribution			400
Writing			9,000
Computer game.	Sponsorship		50,000
Film			5,000
Website			5,000
Teacher-training			45,000
Personnel costs	Coordinator		7,000
Sum			**129,950**

Regular costs/month		
	Personnel providing the contents of website	**250**

The local EE project.

Assumptions.

- There are 4 units of teacher training, arranged in a location in proximity to the schools (80 EUR/ person).
- 40 students per class, 3 classes are provided with materials.
- Costs for writing up the new books are equivalent to 3 persons working 4,5 months fulltime.
- The coordinator accompanies the project for 12 months.
- Regular costs: 1 person is working one week per month to update the contents of the website.

Costs.

Books/ CD.			
Printing	3300 pcs	2,5 EUR/pc	8,250
CD	300 pcs	1,0 EUR/pc	300
Distribution			400
Writing			13,500
Computer game	sponsorship		50,000
Film			5,000
Website			5,000
Teacher-training			24,000
Personnel costs	coordinator		12,000
Sum			**118,450**

Regular costs/month	
Personnel providing the contents of website	**250**

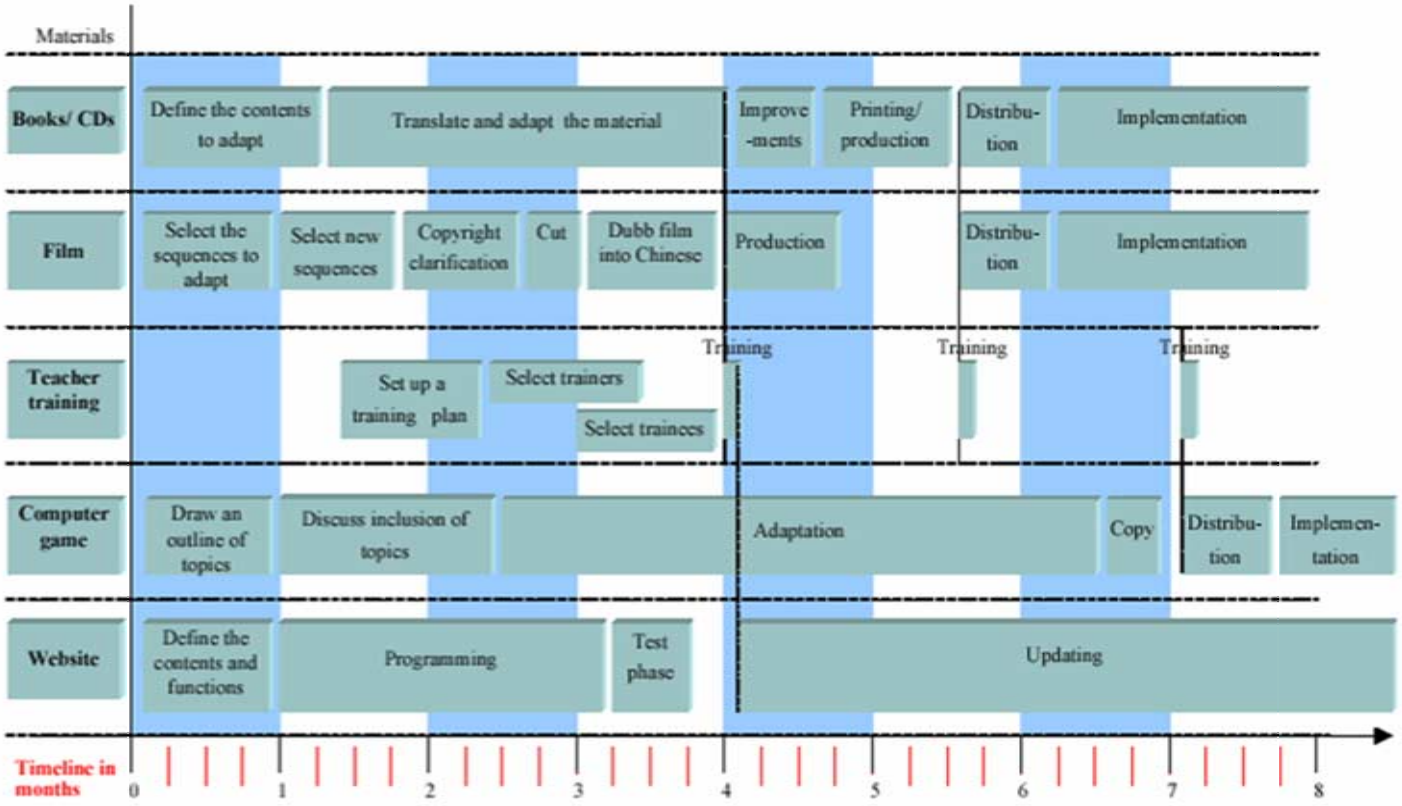
The develop EE project.

Assumptions.

- There are 5 units of teacher training.
- There are 60 students per class, 2 classes receive materials.
- The coordinator accompanies the program for 9 months.
- The workload of writing up the books is equivalent to 3 persons working 4,5 months fulltime.
- The workload of creating the newsletter is 1 person working fulltime for 2 months.
- Regular costs: Set up contents, printing and distribution of the newsletter. 1 person is working on that for 1 week per month.

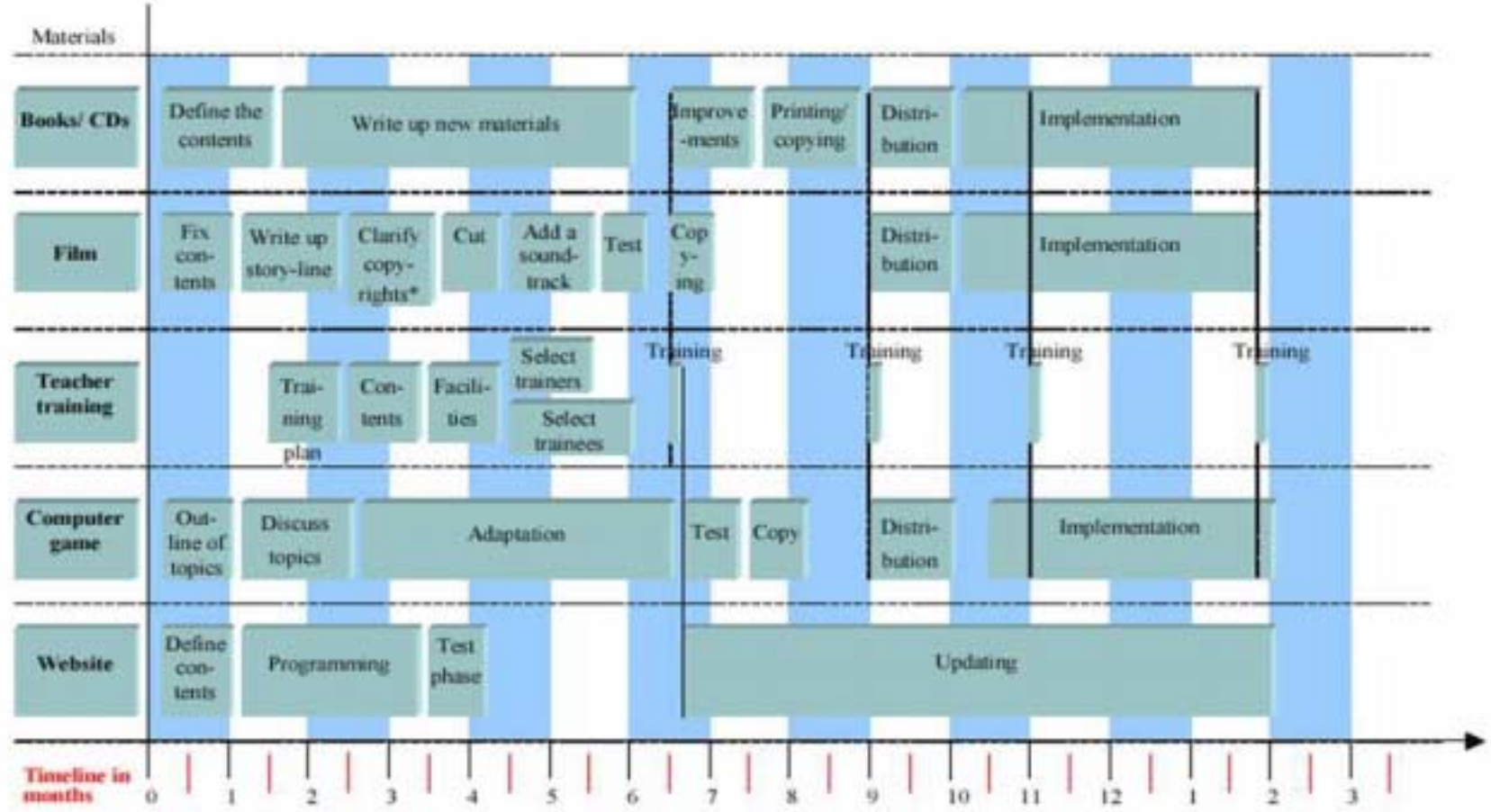
Costs.			
Books/ CD.			
Printing	3300 pcs	2,5 EUR/pc	8,250
CD	300 pcs	1,0 EUR/pc	300
Distribution			400
Writing			13,500
Newsletter			
Design			200
Teacher training			30,000
Personnel costs	coordinator		9000
Sum			**61,650**
Regular costs/month			
	Printing, distribution		110
	personnel		250
			360

Figure 7. The project outline of the ‚global EE project'.



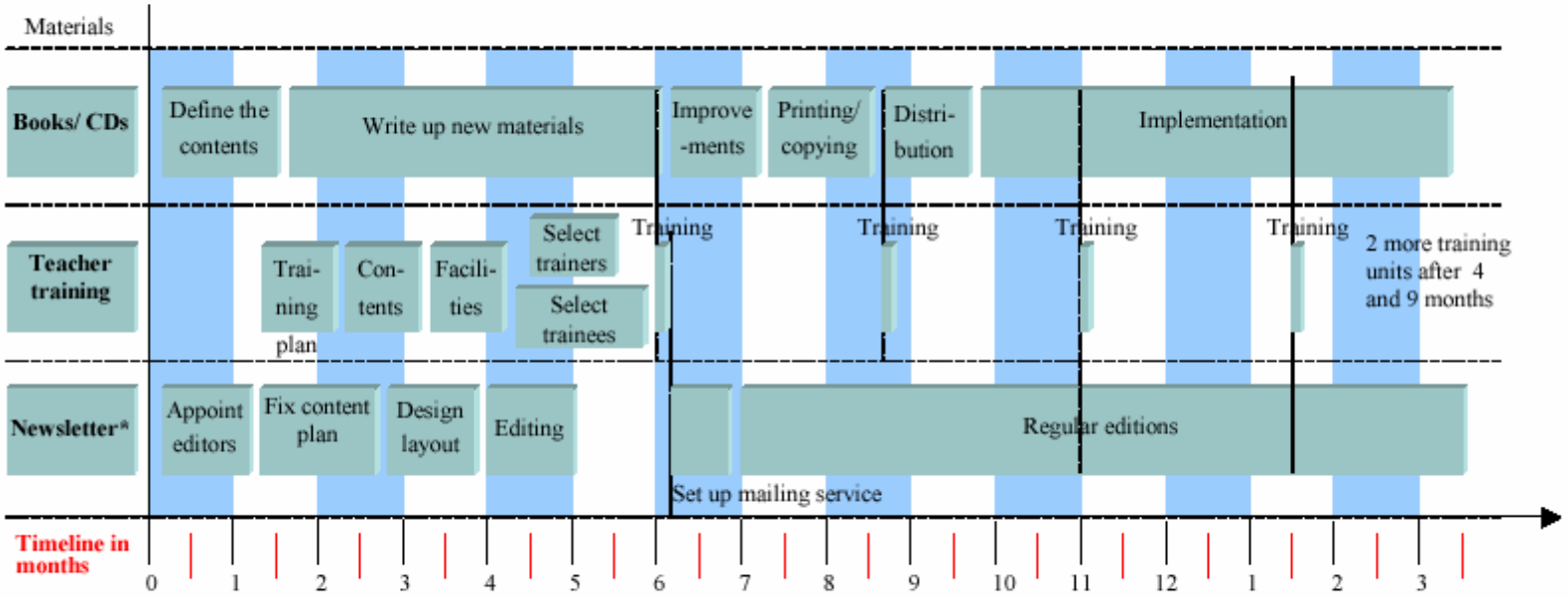
The vertical lines signify: no start of task no. 2 without completion of task no. 1.

Figure 8. The project outline of the ‚local EE project'.



*if the sequences are chosen from the libraries of the partners copyright clarification will not be needed.

Figure 9. The project outline of the 'develop EE project'.



*The newsletter service is provided by the partner who writing and editing the books.

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