Chapter 5 Action Plan for Awareness Raising

5.1 Present State and Issues

5.1.1 Indifference and Over-Expectation

Many people know that solar cell is used for calculator and solar panel generates electricity from sunshine. However common idea about solar panel for the most people in Nigeria especially who are connected to the grid is that it is something expensive and nothing to do with them. Few people consider SHS as an alternative for generator. Few businessmen consider solar panel to start business with. When we visited villages during the field studies, many people expected that we would bring them PV and they would be able to use electricity just like people in town. Some people, among those who have been provided SHS luckily, disappointed when they learnt that they can not use refrigerator or colour TV. Solar energy can be used directly as heat just such as drying wet clothe and food staff. However solar thermal application is still at experimental stage in Nigeria.

5.1.2 Energy, Electricity – Bright Side and Dark Side

Difference between life with electricity and without electricity is enormous. The same thing can be said to industry, society, education, etc. etc. Electricity can be now considered as one of fundamental need for human being along with water, food, shelter, education and security.

On average in Nigeria 40% of population have access to electricity. In rural area only 10% of people have access to electricity despite the government's effort. Rural Electrification is one of most important issues to the government and rural population. Major obstacle to the rural electrification is its high cost for procurement and installation. Extending grid to rural area with no industry and scattered population is not feasible. Putting rural population in the life without electricity is not acceptable government policy. Therefore utilization of renewable energy including solar energy is considered as an alternative to grid extension in rural area.

Utilization of renewable energy should be also considered from a different angle. Globally up to now energy including electricity is produced mainly from fossil fuels. This use of fossil fuels is causing global environmental destruction of critical magnitude. Energy is prerequisite for everything and this prerequisite is causing a situation which can not be accepted. Affluence of developed countries and poverty of developing countries are the cause and the result of this vicious circle. Awareness on this issue is to be created in minds of all of us. It is also very important to realize the influence of Nigeria's policy and decision on the world especially on the developing countries.

5.1.3 Issues of Rural Electrification

Rural electrification is a very important issue which will affect to development, employment, migration to city, education, environment, and so on. Conventional electrification has been relying on grid extension. PV electrification however has an advantage on life cycle costs under certain

condition. In addition to this advantage, PV electrification has several more merits such as; small scale independent installation is possible, in case of grid extended the existing PV system is transferable to other areas, individual installation is possible, and PV system is environmentally friendly. Therefore PV rural electrification is one of most prospective approach for the rural electrification which will supplement grid extension. This point should be clearly realized by the government and potential users.

On the other hand, people tend to expect un-limited electricity from PV just like from grid and this expectation can cause dissatisfaction if it is not met. Dissatisfaction eventually leads to failure of maintenance and payment. For the implementation of PV rural electrification, it is important to let people have right and correct knowledge of PV system including its limit.

5.2 Role of Awareness Raising

From awareness raising point of view, indifference, inappropriate expectation, false understanding, unrealistic image of imminent danger, etc. are the major issues and obstacles to tackle with for the popularization of solar energy. To rectify false understanding, correct information is to be given. To avoid disappointment, proper explanation is to given in advance. These are the typical roles of the awareness raising.

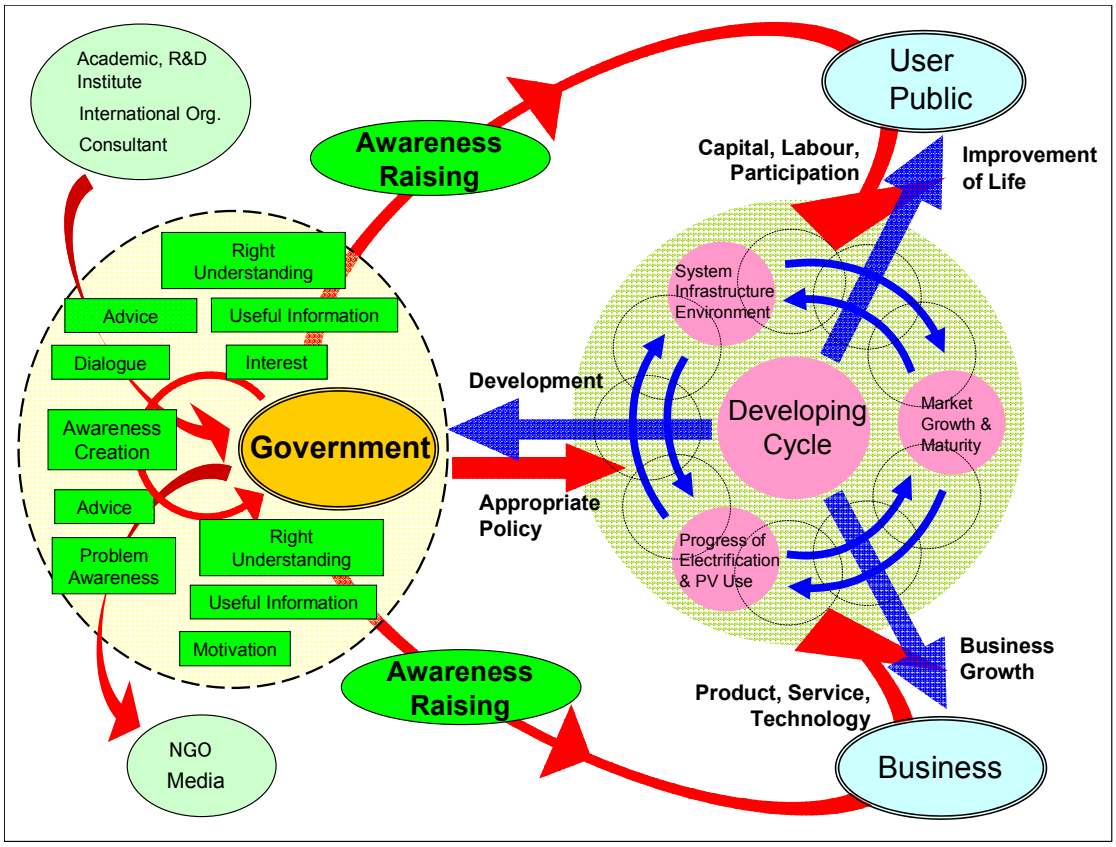
In this action plan, we propose a series of actions with clear direction and objective. Within the framework of the master plan study, the awareness raising is "government's activities such as advocating, motivating, educating people on solar energy utilization in order to avoid and solve imminent problems of PV installation and maintenance in short term, and in order to build favorable and enabling environment for solar energy utilization in long run".

Awareness rising is to achieve the followings.

- People to understand values, advantages, impacts, methods of solar energy utilization and to be motivated
- Solar energy utilization to be promoted with right knowledge
- Procurement, delivery, installation and maintenance to be done smoothly

Effective awareness rising will bring about popularization of solar energy utilization. As it becomes more popular, cost will go down. Low cost will lead to market expansion which will cause further dissemination of solar energy utilization. To realize this successive cycle, not only the awareness but also ability of coordination and judgment, enabling institutional and organizational environment are required. Activities and procedures to obtain these requirements is the capacity development and awareness raising can be defined as a part of capacity development mainly using information transfer.

Awareness raising works in the background of progress of electrification, dissemination of solar energy utilization, market expansion and infrastructure development by motivating and directing people. Fig. 5-1 shows conceptual function of awareness raising.



Source: Study Team

Fig. 5-1 Conceptual Function of Awareness Raising

5.3 Elements of Awareness Raising Activities

Awareness raising activities have four elements i.e. subject (Who), target (to Whom), topic (What), method (How) and procedure (When). "Subject stakeholder" is responsible to raise or create awareness of "topic" in "target stakeholder" by transferring relevant information in appropriate manner ("method" and "procedure"). The followings are brief introduction of each element.

Stakeholders are groups of people, institutions, organizations who have certain roles in awareness raising. Stakeholders are categorized in three groups. First group is subject stakeholder who is responsible to undertake awareness raising. This group includes government, university and research institution, NGO, international organization, and so on. Second group is target stakeholder who becomes target of awareness raising activities such as users, general public, PV suppliers, etc. Third group includes various parties which will assist the awareness raising. Government has a central role in the first group that undertakes awareness raising. However if the government is not yet capable to do this, certain awareness have to be created within the government in the first instance. In the government, various sectors such as health, education, agriculture, communication etc. can be in part categorized in second group because these sectors are also beneficiary of solar energy utilization.

"Topics" are depending on target stakeholders' role, level of knowledge and interest. Some topics are relevant to all stakeholders while some others are relevant to only certain stakeholders. Conceptually the topics are to cover the followings.

- Information to convince and to motivate
- Points which are not recognized
- Points which are understood inappropriately or insufficiently
- Specifically important points to specific target stakeholders
- Impressing and eye-opening information

One topic relevant to all stakeholders is basic knowledge and rationale of solar energy and PV.

We define awareness raising as a part of capacity development using information transfer. Therefore "method"s are means of information transfer. Generally there are two ways or stages by concept to transfer the information. First one is emitting very simple message about topic to unspecific public through mass media, for example showing PV operation scene by TV. Second one is giving detailed and specific information to specific stakeholder, for example training workshop for government officials. Appropriate method should be selected depending on the target and the topic.

Above mentioned elements are looked at in details in the following paragraphs and set of these elements (subject, target, topic, method, and procedure) composes the action which will be described in the last paragraph. This action plan includes the following actions.

- Actions to set up a system for awareness raising within the government
- Awareness raising actions in itself by government (Direct Action)
- Preparatory actions for awareness raising
- Actions to promote awareness raising actions by other stakeholders (Indirect Action)

5.4 Stakeholders

5.4.1 Overview

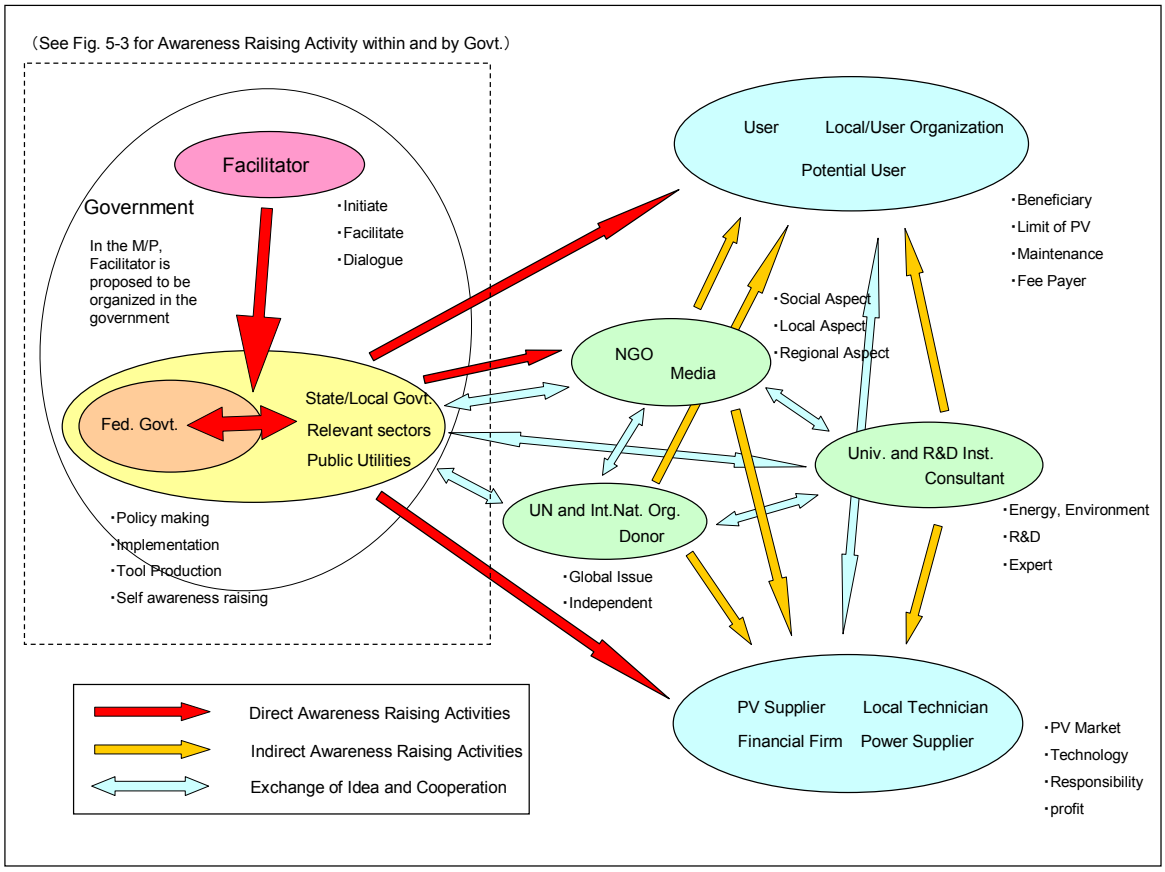
Stakeholder is a group of people, institutions, organizations who has certain role in awareness raising. The following table 5-1 shows the stakeholders in three categories.

Table 5-1 Stakeholders in Three Categories

WHO are responsible (Subject Stakeholder)	WHO are target （Target Stakeholder）	WHO are catalyst or means (Assist Stakeholder)
(Direct Action) Facilitator Government (Indirect Action) NGO University R&D Institute Media International Organization Donor	(1) Government Federal Government (Energy, Power, S&T, Finance) (Relating Sectors – Health Agriculture, Education Communication, Gender, etc.) State/Local Government Public Utility (2) User Electrification Beneficiary Self-purchase User Corporate User Potential User (3) Business & Industry PV Supplier and Installer Local Shop and Technician Bank and Financial Business Private Electricity Provider (4) Others NGO Media	NGO University R&D Institute Consultant Media International Organization Donor

Source: Study Team

Fig. 5-2 shows conceptual roles and relations of all stakeholders in awareness raising. In the figure, red allows show awareness raising activities by the government (Direct Actions) and yellow allows show awareness raising activities by the other stakeholders (Indirect Actions). This action plan mainly deals with the direct actions by the government (red allows) and government actions to promote the indirect actions (yellow allows). Further detail within the government is shown in Fig. 5-3.



Source: Study Team

Fig. 5-2 Roles and Relations of Stakeholders

5.4.2 Stakeholders Responsible to Awareness Raising (Subject Stakeholders)

(1) Government and Facilitator

Within the framework of this action plan, the actions are described from government's point of view. Nigeria government is primarily responsible for awareness raising activities. As we have seen already there are many stakeholders and complex relations among each stakeholder. Therefore we establish a facilitator which is a core body of awareness raising. It maybe well understood if it is referred to as an "Inter-Sectorial Awareness Raising Committee". Generally the facilitator can be a division of the government, NGO or private organization with delegated authority by the government. In Fig. 5-2, the facilitator is placed in the government at left side, conceptually it is at center and related with all stakeholders through the government.

At the beginning facilitator takes initiative to mobilize major stakeholders within the federal government such as FMPS, FMST, REA, ECN to establish a system for awareness raising. This process is described in action plan phase 1 in later paragraph. Other relevant government sectors such as health, education, agriculture, etc. and state/local government will join the system in phase 2. After establishment of the system, each responsible stakeholder take initiative of continuous awareness raising activities in respective areas and in respective manner while facilitator works as a forum for dialogue and sharing information of all stakeholders. This process will take place in phase 3 and phase 4.

As a practical idea, we propose that JWG will act as the facilitator at least in the early stage of awareness raising and its secretariat is to be established in the federal government. Within the framework of rural electrification, the facilitator can be a division of REA in the future. However solar energy utilization has wider dimension beyond just rural electrification. In this regard the facilitator also can be a division of FMST and/or furthermore a division of proposed National Renewal Energy Agency (NREA) in ECN/UNDP Renewal Energy Master Plan (REMP).

(2) Other Stakeholder Undertaking Awareness Raising Activities

NGO, University, Research and Academic Institution, International Organization, Donor, etc. also play a vital role in the awareness rising. This action plan is prepared for the government. Therefore this action plan does not present actions to be taken by the NGO and other stakeholders in this group for awareness rising.

However this action plan includes government's actions to NGO and other stakeholders in this group that will motivate, initiate, facilitate, and activate awareness rising activity by the NGO and the others in the fields of their competence by their own initiative. Such activities are referred to as indirect actions and shown by yellow allows in Fig. 5-2. In fact such indirect actions (from government's point of view) are as important as the government's direct actions.

5.4.3 Target Stakeholders

(1) Government

Government is the principal stakeholder that is responsible to awareness raising. In order to be able to create and raise awareness on certain point in other stakeholders, the government itself must have the awareness on that point. If the government lacks that awareness, it will be the target stakeholder and the awareness is to be built within the government in the first place. Such activity includes motivational and training workshops. Some government sectors such as health sector, for example, are in part can be target stakeholders as a user. This action plan categorizes the government as target stakeholder in the following five groups.

1) Federal Government – Energy and Electricity Sectors

This group includes C/Ps of this master plan study such as FMPS, FMST, ECN, REA, NPC and this group forms a core part of the facilitator. This group must recognize that they are responsible

to awareness raising and they are to have enough capacity to convince the other stakeholders.

2) Federal Government – Finance and Commerce Sectors

This group includes Federal Ministry of Finance, Commerce and Industries. This group has big tools such as subsidy, taxation and other enabling legislation and policy making for popularization of the solar energy utilization.

3) Federal Government – Others Relevant Sectors

Ministries that are included in this group are Agriculture & Rural Development, Communications, Education, Environment, Health, Labour & Productivity, and Women Affairs. These ministries plan and execute programs in accordance with national policy and each ministry's priority and field of competence. If each ministry actively introduce PV systems as a user, this is in itself a powerful drive force for awareness raising because many people in many sectors and areas will have chance to see, use and benefit from PV. It is further to be noted that level of awareness on the importance of PV should not stop at this level. If concerned ministries seriously recognize the importance of electricity by evaluating the difference of, for example, rural clinics with vaccine and without, night classes with light and without, disaster scenes with radio communication facility and without, and so on. Once the values of PV are correctly recognized, introduction of PV will be own priority which will lead to the popularization of PV. Knowledge, know-how, experience, and lesson learnt from various relevant programs and projects of all sectors are to be shared. For example, experience of establishment and operation of the Water Use Association of agriculture sector will be very useful for the establishment of the village electrification committee and furthermore the association itself has a potential to act as the electrification committee as well. Network and database for sharing information and facilitating cooperation must be established.

4) State/Local Government and/or REA

At present, state governments and public utilities are playing central role in rural electrification scenes. In the near future, roles of state governments, recently established REA and public utilities which are currently in the process of privatization are to be re-structured. However whatever the roles of REA and public utilities, which seem to be rather technical though, are, state government and local government probably will be the most suitable player for awareness raining on local users and local enterprises. Therefore in this action plan, actions are so built that state/local governments are responsible for the awareness raising at local level. It is to be noted that actual entity of rural electrification varies from the state. In Jigawa state, the state government delegates the function of PV electrification to JAEF on project bases while the state electricity board is undertaking grid electrification. In Ondo state, the Ondo state electricity board, in Imo state, the Imo state ministry of public utilities & rural development are responsible for rural electrification respectively.

5) Public Utilities

Public utilities such as ex-PHCN are currently in the process of dissolving and privatization. Although structure and function of public utilities vary from the area, they have technical and practical functions.

(2) User and Potential User

In narrow sense, users are defined as the stakeholders such as villagers, users, businesses, public

bodies, etc. who benefit from the electricity as the result of rural electrification. In much wider sense if beneficiaries are extended to the stakeholders who benefit from the utilization of solar energy, users in urban areas and grid connected area are also included. From the point of view of utilization of solar energy, the users are categorized into the following 3 groups.

1) Direct Beneficiary of Rural Electrification

This group includes villagers, communities, businesses, etc. in the area selected for PV electrification. Most important awareness to be created in this group is that PV has a limit and to some extent the user must participate in the maintenance and operation. Without this awareness, user's disappointment and payment failure may lead to collapse of the system. Also the user's mentality on excessive reliance upon assistance and aid should be amended.

2) Individual PV Buyer

This group includes relatively high income individuals, businesses, communities, institutions and so on and also includes grid connected users. Although this group is not direct beneficiary of rural electrification, their pioneering role to PV introduction will be a vital drive force for PV market growth and capacity development. Since it is expected that education level of this group is relatively high, awareness raising on not only practical PV use, but also values of PV relating to environmental friendliness will be possible. Actions on this group must be accompanied by actions on PV supply chains. The supplier must be able to supply PV system which meets the user's needs. Awareness to be created in this group is concerning benefits from PV, limits of PV, costs, maintenance of PV and values of PV.

3) Other Potential Users

Distinction of this group and two groups mentioned above is not clear. However member of this group can fall in either group 1) or 2) in the future. Therefore awareness raising on PV in this group provably using simple message by mass media will be useful for foundation building for solar energy utilization.

(3) PV Supply Chain and other Business Community

This is the group which benefits from rural electrification and solar energy utilization by supplying and providing PV hardware, power generated from PV, related service, and capital. This group includes PV manufacturer, importer, assembling company, installing company, maintenance Company, shop, technician, power and service supplying company, bank, etc. Since the interest of this group is benefit making, awareness raising alone is not enough for letting them to take action. However awareness raising can do a lot in collaboration with provision of enabling policy by the government and can provide business ideas which will motivate them to start PV business. Even if the PV electrification is a supplement measure to grid extension to fill the gap between current situation and future grid, the following facts gives business chances: i) 90% of rural population has no electricity, ii) electricity provided by grid is not always stable and reliable, ii) future extension of grid to cover whole nation will be difficult. Awareness raising on importance of corporate morals for quality control of product and service is also important. This group is categorized in the following 4 groups.

1) PV Manufacturer, Importer, Supplier and Installer

This group manufactures, imports, supplies and installs PV systems. Also this group provides technical support for maintenance and repair to users. It is to be noted that at present most of these companies are found in Lagos area.

2) Local Shop and Technician

This group has a direct contact with local users. It is to be noted that this group also has a role of employment creation in the area.

3) Bank and Finance Business

This group provides capital or service to users and businesses. The high initial cost of PV is major obstacle for both potential users and potential businesses and this is the business chance for this group. Government has several options to motivate this group.

4) Private Electricity and Service Provider

Power generation, transmission and distribution in Nigeria have been undertaken by the government and public utilities traditionally in Nigeria. However in the current trend of liberalization and privatization, it is expected that many private companies will start these businesses.

(4) Other Target Stakeholders

We consider that NGO and Media in certain extent can be targets of awareness raising. By creating the awareness on the benefits and values of PV, it is expected to play important roles in awareness raising which will assist, supplement and reinforce the government effort.

1) NGO

There are many types of NGOs. We classify stakeholders in three categories i.e. subject stakeholders, target stakeholders and assist stakeholders. Depending on nature, NGO can be any one or more of these categories. In many cases local NGO has deep root and connection with local people and community. Therefore this NGO can be very helpful for mobilizing people to organize village electrification committee for example. In many cases NGO has competence in certain field with a specific objective and an awareness of specific issue. Therefore NGO can be very strong advocate to address the issue. Taking these natures of NGO into account, if the government acts on NGO in an appropriate manner that the approach matches the nature of the NGO, NGO can be very useful tool for awareness raising. This point should be recognized by both NGO itself and government.

2) Media

This group includes TV, radio, ISP, newspaper, publishers, etc. One may argue if the government has some control on the media. Even if so at least media can be a major tool for awareness raising for general public. If media recognize their capacity and values of solar energy which can be a clue to tackle with the global and also local issues such as environment, poverty, etc. the media initiate campaigning solar energy utilization. In our point of view, government's action and dialogue to induce such recognition and motivation within media is important awareness raising.

5.4.3 Assist Stakeholders

Universities, research and academic institutions, international organizations, donors etc. are

categorized as stakeholders undertaking indirect awareness raising activities. This group can be also stakeholders which assist awareness raising activity by providing information, advice, expertise, and human resources in the fields of their competence. In this regard it may be inappropriate to state that the government is in a position to create awareness in these stakeholders. However the government and these stakeholders are influencing each other through dialogue.

5.5 Topic of Awareness Raising

5.5.1 Overview

As described briefly earlier, the topic of awareness raising is theme and content of the information which is to be transferred from subject stakeholder to target stakeholder in order to create and raise awareness of this point in target stakeholder. The overall topics range over vast areas and specific topics vary from one target to another. Appropriate topics are to be selected depending on role and interest of the target. Some topics are commonly important to all targets while some topics are specifically relevant to specific stakeholder. At least correct knowledge on solar energy and PV is to be shared by all stakeholders to avoid misunderstanding and to give the rationale of solar energy and PV.

In this paragraph, the topics are listed in detail for each of four major target stakeholders i.e. government, user, business and others. These four major stakeholders are further divided in several sub-groups as described in the previous paragraph. Therefore each awareness raising action is to be designed with appropriate topics selected from the following list in accordance with role, interest and level of awareness of the targeting stakeholder at sub-group level.

5.5.2 Topics for the Government (Federal Government, State Government, Relevant Sectors, Public Utility)

It is to be clearly understood that the government is a primary stakeholder responsible for awareness raising. Therefore in principle, the government's awareness is to cover everything even those topics listed under user, business and others although there may be some variations at sub-group level. At first the government must have awareness on the rationale of solar energy utilization and PV. The government must convince themselves of the values of PV. The government can not convince others of thing which is not accepted by the government itself. One of the most important topics for the government is the awareness of the difference of user's role in grid and off-grid electrification. In grid electrification user's main responsibility is tariff payment and this is commonly understood and accepted. However in PV off-grid electrification, users are generally quite deeply to be involved in the maintenance. This user's responsibility and its implication are not recognised yet. This is explained in detail below.

＜Detailed Topics＞

- PV rationale to accept and convince the others.
  Rationales of PV must be agreed and the government must accept the values of PV in order to convince other stakeholder of the values of PV. National and global issues which require solar energy such as low electrification level of Nigeria, environmental destruction caused by use of fossil fuel, coming exhaustion of fossil fuel, poverty,

population expansion, trend of world policy, national policy, etc. must be understood in the first place. There are several epoch-making literatures and policies such as Agenda 21, Kyoto Protocol, MDGs, NEEDS, REMP, etc. The government also needs to recognize the influence of Nigeria's policy and commitment towards the achievement of MDGs.

- Recognition of the difference of user's role in grid and off-grid electrification.
  In the conventional electrification, the government is to extend the grid to users and users are to pay the tariff. Government carefully prioritizes the area so that the costs can be recovered. If there is a misuse or malfunction of connected device, maybe just a fuse is brown or a breaker cuts the circuit. However in the PV electrification, generally recovery of the costs is not easy without the subsidy at least in early stage. Furthermore the user is required to play a significant role in the maintenance in addition to the tariff payment. Importance of awareness creation in user to achieve sustainable maintenance of the system and payment without delay and dissatisfaction further implies to the government that i) the government is required to develop human resources for the awareness creation and establishing maintenance organization (see the chapter 4), and ii) this process of awareness raising and organization establishment is to be included to the conventional electrification procedure. As shown in the chapter 2, in order to achieve the government's goal of rural electrification until the year 2020, about 340,000 household are to be electrified by means of PV system. Each state differs in electrification target and method from other states as shown in the chapter 2, but the following calculation gives some rough idea of what this target of 340,000 households implies. To simplify the calculation, we just take simple mean value without considering the difference in the states. If the electrification is to start in 37 states from the year 2007 and to complete in 2020. In every state 700 households are to be electrified each year. Whatever the business model the states adopt, for awareness creation and formation of the maintenance organization, at least a few staff in each state and at least 100 trained staff in total will be required. Training includes knowledge on PRA which is described in the chapter 4. It is to be noted that at the early stage of the PV electrification in most states, the process will be considered as pilot projects which will come with a plenty of problems similar to this study team had to face in its pilot projects. Our pilot project electrified just 180 household.
- Awareness on the significance of trickle-down effect of PV electrification by the government and importance on awareness creation on this point in the business community. If, as a simple example, the 340,000 households are to be electrified by means of SHS, total installed capacity per year amounts to 1,438kWp and this is equivalent to 6 times of total PV actual installed capacity as of the year 1999 which was 238kWp [1]. Expected effect of this magnitude is noteworthy. Government's commitment on the electrification is to be clearly publicized.

[1] The paper by Prof. O.C. Iloeje, ECN, presented at Renewable Energy Conference "ENERGETIC SOLUTIONS" Abuja/Calabar, 21-26 November, 2004

- There are many stakeholders in the government such as FMPS, FMST, REA, ECN and state governments. This point is to be kept in mind of the government and facilitator is to provide initiative and coordination in the government.
- Rural electrification is not only the issue of the power and energy sectors but also the issue which affects many other sectors such as health, agriculture, environment, communication, gender, rural development, employment, etc. For the purpose of the awareness raising, benefits and values of PV, experiences and lessons learnt, information on the projects, know-how are to be shared among all sectors by creating a database and a network.
- General knowledge of renewable energy, solar energy and PV. Knowledge of SHS, BCS, Mini-Grid and their characteristics. Understanding of the business models, initial costs and life-cycle costs.
- Transferability of PV system from one area to another area when grid electrification reaches that area. Awareness on this point is important at the planning stage of rural electrification to prioritize the areas.
- At present many PV businesses are based in Lagos. When the government takes actions targeted on the business, this point must be taken into account.
- Effect of PV on the environment especially disposal of battery acid and recycling of battery. Preventive measure must be a part of electrification process.
- Progress of R&D on solar energy utilization in Nigeria and world.
- Energy consumption pattern of household without electricity and amount spent on the energy. This is a vital element on business model decision.
- Meaning and role of electricity. Generally from the government's point of view electricity can be regarded as welfare of people and infrastructure of nation. For big business electricity is infrastructure while for rural low-income population electricity is rather welfare. In either case, electricity brings fundamental difference.
- Change of life and benefits brought by electricity especially for women.
- Costs of conventional energy and electricity are based on fossil fuel and not taking the external costs such as environment and security into consideration. Awareness on achieving the level playing field is important.
- Awareness on the importance of the R&D, date and target setting, capacity development as factors to popularize PV and solar energy utilization.
- Importance of the market formation, growth and maturity. Knowledge and importance of various policy options of the government such as subsidy, taxation, concession, electricity feed-in law, power purchase agreement, carbon finance, etc. Study on policies of other countries.
- Importance of quality control and standardization of technology. Establishment of executing agency for this purpose.
- Trend of international organizations and donors.
- Role of school education on the awareness raising.
- Awareness on the role and moral of the government.

5.5.3 Topics for the User (Electrification Beneficiary, Individual Buyer, Potential User)

Major topics for the user are basic knowledge of solar energy and PV, understanding of the limit of PV and costs to prevent disappointment, knowledge of daily maintenance, and awareness of user's moral and payment.

＜Detailed Topics＞

- General knowledge of renewable energy, solar energy and PV. Basic knowledge of SHS, BCS, Mini-Grid and their characteristics.
- Change of life brought by electricity.
- Benefits to women.
- Initial costs and life-cycle costs.
- Limits and life span of PV.
- Daily Maintenance.
- Disposal of battery acid, recycling of battery, and effect to the environment.
- Future prospective of solar energy and PV and trend of business.
- Government's commitment and various favorable policies.
- Importance on the participation and cooperation to maintenance organization/system.
- Information of use's responsibility, contents of service and tariff.
- Moral on the use of public facility.
- Understanding of government policies and foreign aids to correct over-expectation and dependence.

5.5.4 Topics for the Business (PV Supply Chain, Local Business & Technician, Financing Company)

Major topics for the business communities are basic knowledge of solar energy and PV, PV's potentials and business ideas to motivate them to start business, and awareness of business moral and quality control.

＜Detailed Topics＞

- General knowledge of renewable energy, solar energy and PV. Basic knowledge of SHS, BCS, Mini-Grid and their characteristics.
- General understanding of the issues relating to energy and environment.
- Future prospective of solar energy and PV, trend of business and government's commitments.
- Knowledge of PV systems such as SHS, BCS and Mini-Grid. These system's features and limits.
- Understanding of the business models and suitable environment for the business models.
- Initial costs and life-cycle costs.
- Disposal of battery acid, recycling battery, and effect to the environment.
- Information on the energy consumption pattern of household without electricity and amount spent on the energy.
- Practical knowledge of PV assembling, installation and maintenance.
- Progress of R&D in Nigeria and the world.
- Awareness of importance of business moral and quality control.

- General understanding of relating government policies such as subsidy, taxation and other favoring measures for solar energy and PV.
- Business ideas. For example, in Kenya locally assembled (parts were imported) small power (10 – 20Wp) SHS are very popular although low quality is a problem[2]. In Mali, Mr. Doucoure sold several thousand of small power SHS[3]. Soft-loan to the user, Tariff collection, etc. etc.

5.5.5 Topics for the Others (NGO and Media)

Major topics for the NGO and Media are also basic knowledge of solar energy and PV, good understanding of values and benefits of solar energy and PV. Also awareness on the roles and potential of NGO and Media is important.

＜Detailed Topics＞

- General knowledge and rationale of renewable energy, solar energy and PV. Basic knowledge of SHS, BCS, Mini-Grid and their characteristics.
- General understanding of the issues relating to energy and environment.
- Future prospective of electrification and government policy.
- Role and meaning of electricity as stated in the topics for the government.
- Change of life and benefits brought by electricity especially for women.
- Disposal of battery acid, recycling battery, and effect to the environment.
- Initial costs and life-cycle costs.
- Future prospective of solar energy and PV and the government commitment.
- General understanding of relating government policies such as subsidy, taxation and other favoring measures for solar energy and PV.
- Understanding of establishment and running of user's organization for maintenance.
- Progress of R&D in Nigeria and the world.
- Impressing, appealing and eye-opening information. For example, SHS 1 set reduces emission of 120kg CO_2 per year[4].
- Awareness of nature and role of NGO and media such as social dimension, local dimension and public dimension.

5.6 Tools for Awareness Raising

As described already, awareness is created and raised by transferring the information (the topics) to the targets. Here below are i) tool for information transfer i.e. method and media, ii) tool for information gathering, keeping and sharing i.e. network and database, and iii) tool for deepening knowledge i.e. sources of information.

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[2] Kenya's PV Market (2000), Moses Agumba and Bernard Osawa, Solar Energy Network (SOLARNET), Kenya

[3] IEA PVPS Task 9, Report T9-07 (2003), 16 Case Studies on the Deployment of Photovoltaic Technologies in Developing Countries

[4] GEF Medium-Sized Project –Proposal 35986 (2005), Rural Electrification and Renewal Energy Development, World Bank

5.6.1 Method and Media

Methods and media for information transfer are listed in Table 5-2 in four categories. A set of most appropriate methods and media are to be selected for each action.

Table 5-2 Methods and Media for Awareness Raising

Suitable Target	Method
General Public	Radio, TV, Newspaper, Magazine, Brochure, Flier, Billboard, Poster
Public with specific interest	Web-site, Promotion Video, Event, Fair, News-letter
Specific party with specific interest	Seminar, Workshop, Training Course, Manual, Demonstration
Depending on the case	School Education, Opinion-Holder/Leader

Source: Study Team

5.6.2 Network and Database

Since rural electrification has many responsible stakeholders such as federal government, state government and community, there is no single body that has comprehensive data and information. Also there are PV systems introduced by the users individually. This individual PV introduction is very important component for the PV market growth and technological capacity building. Government (the facilitator) is to establish the nation-wide network and the database for the information relating rural electrification and PV introduction. The database should include at least the following information.

- State of rural electrification in each state.
- State of PV introduction in each state.
- State of PV introduction in government's relevant sectors, private sectors, NGO sectors, and donor sectors.
- List and state of PV business in each state.
- List and state of NGOs, community activities in each state.

5.6.2 Sources of Information

Basically this report of the master plan study provides necessary information. The following websites provide sources of wide range of deeper knowledge and information. Especially a series of IEA reports listed first will be very informative for the government parties concerned.

- IEA Photovoltaic Power Systems Programme, Task 9
  http://www.oja-services.nl/iea-pvps/tasks/i_task09.htm
- UNDP Energy for Sustainable Development
  http://www.undp.org/energy/publications.htm
- World Bank RE Toolkit
  http://web.worldbank.org/
  (Home>Topics>Energy>RE Toolkit>Project Tools>Knowledge Documents)
- Global Energy Network Institute, Global Issues and Policy Issues
  http://www.geni.org/globalenergy/policy/renewableenergy/index.shtml

5.7 Overview of the Action Plan

5.7.1 Phases of Action Plan

So far we have described the components of the action i.e. stakeholders (subject and targets), topics and methods. In this paragraph we consider time component of the action.

As shown in Table 5-3, process of preparation and implementation of the awareness raising activities are divided into four phases for ease of understanding. Phase 1 and 2 are reparation period in which a system for the awareness raising is created within the government. Phase 3 and 4 are continuous implementation period of awareness raising.

In phase 1, at first the facilitator is organized and the system for awareness raising at federal government level is created. Phase 1 starts after submission of the master plan and is expected to complete in three months. In phase 2, the system for awareness raising and staff development at stale/local government level is created. Phase 2 is expected to complete in 6 months. Phase 2 is not necessarily exact subsequence to Phase 1. Some activities in phase 1 and 2 can progress simultaneously. Phase 1 and 2 should be complete before commencement of the PV rural electrification. Phase 3 is a continuous implementation period of awareness raising targeting general users and public. Phase 4 is targeting specific users, beneficiaries and business circles concerned with the actual PV electrification.

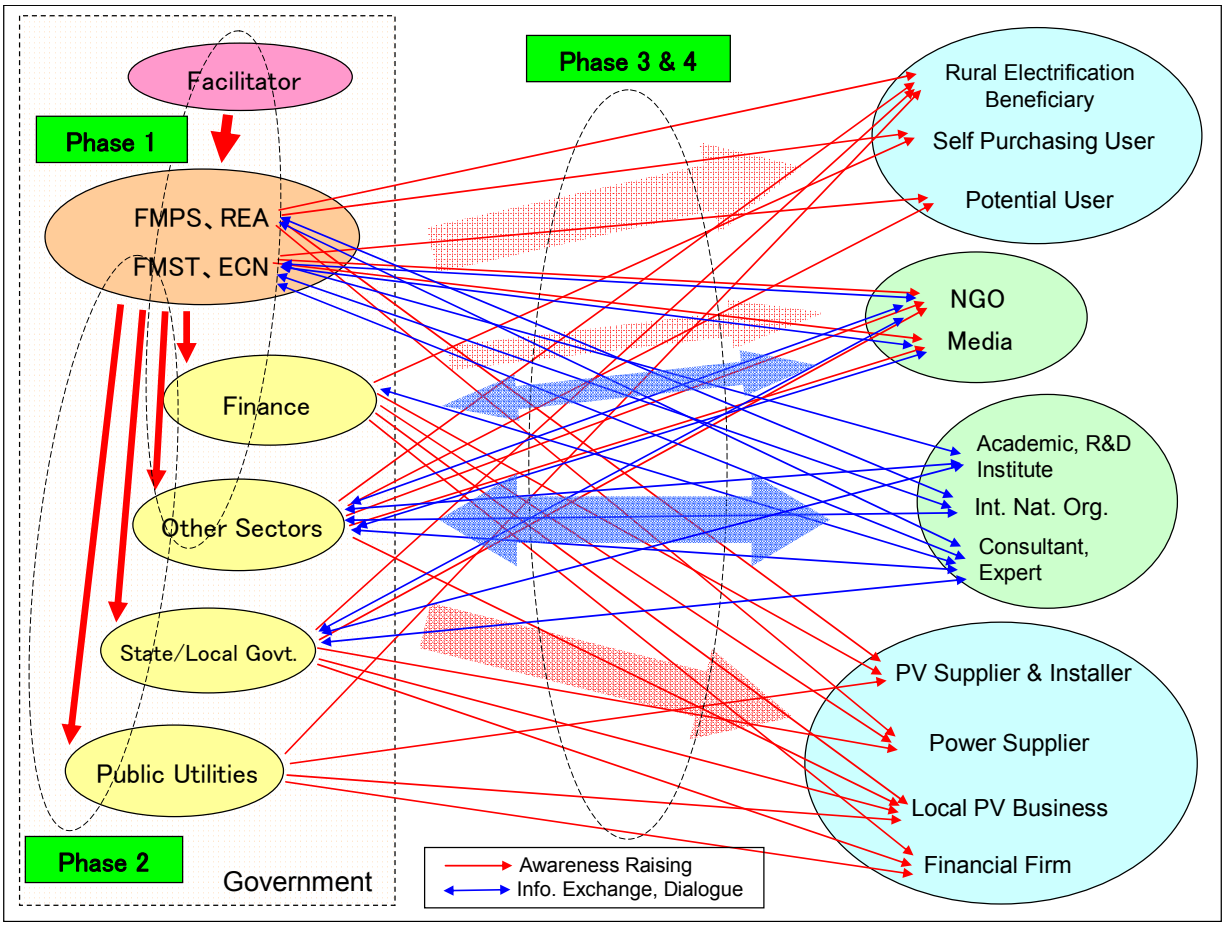
Table 5-3 4 Phases of Awareness Raising Activities

Phase	Period	Main Activities
1	3 months after M/P submission	- Formation of the facilitator - Training workshop at federal level - Tool Production
2	6 months	- Training workshop at state/local level - Creation of staff development system - Tool Production
3	Continues after Phase 1 and 2	- Awareness raising on general public, business, etc. - Coordination within the government - Exchange ideas with NGO, media, donors, etc. - Keep-up training workshops within the government
4	Continues with electrification after Phase 1 and 2	- Awareness raising on target user, business, etc. (see also M/P chapter 4)

Source: Study Team

5.7.2 Roles of Government Sectors

Within the framework of this master plan, the stakeholder directly responsible to awareness raising is the government. This subject stakeholder (= the government) is divided into several sub-groups such as federal government power sectors, finance sectors, other relevant sectors, and state/local government. Target stakeholders are made of three major groups (the government itself, the user, and the business) each of which is divided into several sub-groups with different natures and roles. Awareness raising activities are interactions between these subject stakeholders and target stakeholders at sub-group level. Each action can be sown as an arrow from a specific subject stakeholder to a specific target stakeholder with specific topics in specific manner. For example when we think about actions on the user, FMPS and FMST may have different detailed targets in accordance with their priorities and policies. These relations are shown in Fig. 5-3. This is to be noted that relations shown in the figure by narrow arrows are not definite relationships because roles of the stakeholders within the governments are not clearly established in the current power and electricity sector reform. Fig. 5-3 also schematically shows the phase 1 to 4 of the actions.



Source: Study Team

Fig. 5-3 Relations of Awareness Rising Auctions Between Government and Targets

At first in phase 1 the facilitator initiates the action within the government. The facilitator mobilizes and trains the government prime stakeholders to establish the system at federal level in phase 1 by coordinating meetings and workshops. In phase 2 the system involving the relevant

sectors and state/local government is created by the facilitator and trained staff from federal ministries. As stated in paragraph 5.4.3, REA has been just established and its role in the electrification at local level is not yet clarified. Therefore in this action plan, we assume that main stakeholder responsible for awareness raising at state and local level is state/local government.

If we consider the government as one group, awareness raising activities in phase 3 and 4 are conceptually grouped by a few bold arrows connecting the government shown at the left in Fig. 5-3 and the major target groups shown in the right. Individual actions are shown by numerous narrow arrows connecting the sub-groups of the government and sub-groups of specific target. In Fig. 5-3, red arrows show the government's direct awareness raising actions on the target stakeholders while blue arrows shows government's interactions with assist stakeholders. In phase 3 and 4, the facilitator continues to maintain and raise the awareness within the government and provides a forum for discussion and information sharing among all stakeholders.

5.8 Action Plan

5.8.1 Phase 1 : System Formation within the Federal Government

(1) Formation of the facilitator

In paragraph 5.4.2 (1), we are proposing that JWG will act as the facilitator at least in the early stage of awareness raising and its secretariat is to be established in the federal government. JWG is existing and functions of the facilitator have been clearly established. Therefore at the first meeting of the facilitator, chairperson of the facilitator is to be named and office space for the secretariat is to be sought. Funds for a full-time secretary, office equipment such as PC, honorarium and transport for resource persons for the workshops described below are to be allocated.

(2) Facilitator's workshops and formation of the task force

After formation of the facilitator, the facilitator invites a few more staff from FNPS, FMST, ECN and REA's six regional branches and organizes a series of workshops with appropriate resource persons. The participants will form a task force of the facilitator. This master plan report and the demonstration equipment are to be used in the workshops. Through the workshops participants are to fully understand all topics for awareness rising. Resource persons are to be selected from the government sectors as much as possible to reduce costs in consultation with universities and consultants. The facilitator's task force i.e. the participants to these workshops, are expected to be responsible in tool production and staff development at state/local government level in phase 2 and later stages.

(3) Establishment of database and information sharing

The facilitator establishes a database based on the structure described in paragraph 5.6.2 using MS Access or other suitable application. The master database is kept in the PC of the secretariat or in a server specifically designated for the database. A template is to be prepared in order to share and update the information among the stakeholders such as relevant federal ministries, state/local government, and relevant sectors. The information from various sectors and areas in the

template's format is transferred to the master database by means of internet, CD, flash-memory, etc. In the future the database is uploaded to a website of the facilitator.

(4) Exchange information and ideas with the government's relevant sectors

The facilitator call meetings with participants drawn from press or PR department of the relevant sectors such as health, education, agriculture, communication, gender, finance, etc. in order to share understanding and information on solar energy and PV. Through the meetings the facilitator is expected to grasp the relevant information and channels which can be used for the awareness raising in each sector. Facilitator is to prepare a detailed questioner to collect relevant information from the sectors for the database. This kind of meeting is to be held regularly and the database is to be updated and shared.

(5) Production of tools for the government workshops

The facilitator's task force produces tools to be used for the awareness raising workshops for the government. The tools include presentation, manual, text and resource papers. Manuals prepared by the study team will be useful. Materials for PRA workshops (see chapter 4) are also prepared here. At initial stage if necessary, assistance from a consultant can be considered.

(6) Production of tools for user and business circle

The task force also produces tools for beneficiary users of the electrification and concerned business circles such as PV suppliers and installers. The tools include presentation for user workshop, user manual, summarized booklet and information flier for user and business, and questioner for business for data collection. These tools will be continuously used in phase 2, 3 and. 4.

(7) Procurement of demonstration equipment

If possible, the facilitator and/or concerned federal government ministries are to purchase demonstration equipment for the government workshops. Tender documents are to be given with the booklets and the fliers to raise awareness on solar energy and PV. Also the questioners are to be filled. Downsized procurement can be done several times so that more suppliers are involved. This procurement is not only for getting the equipment but also for awareness raising in the business.

5.8.2 Phase 2 : System Formation within the State and Local Government

(1) Regional workshops and formation of regional task forces

With initiative of the facilitator and with actual organization by the task force, training workshops are held at the REA's regional branches and/or selected state capitals. Participants are drawn from state governments and relevant sectors in the region covered by each REA branch. Members of the task force will be resource persons of the workshops. During the workshops, the tools prepared in phase 1 and the demonstration equipment are to be used. PRA (see chapter 4) is also covered in the workshops. If there are existing PV systems in the region, those systems can also be used for demonstration.

The participants to these workshops will form regional task forces. The regional task forces and the members will be responsible to i) training and development of state/local government staff who will be responsible for awareness raising and user's organizations formation at the electrification sites, ii) production of tools to be used for local user and business, and iii) organization of workshops and meetings for state/local governments, users and businesses in phase 3 and 4.

(2) Training workshops at state/local levels

The regional task force organizes training workshops for state/local governments in the respective area. The participants will be responsible for awareness raising and user's organizations formation at the electrification sites. Tools prepared by the federal task force are to be used.

(3) Production of local version tools

The regional task force produces or translates the booklet and the information flier for user and business, and the questioner for business for data collection in local language. English version and local language version are to be selected properly depredating on the target.

(4) User's seminars

Participants to the regional training workshops from state/local government organize seminars targeting on the general users in each state capital and selected local capitals. This is partly a practical training for young staff of state/local government. The tools in local language or English are to be used.

(5) Procurement of demonstration equipment

If possible, the state/local governments are to purchase solar demonstration equipment for staff training and awareness raising in the general public. Tender documents are to be given with the booklets and the fliers to deepen understanding on solar energy and PV. Also the questioners are to be filled by the suppliers. This procurement is not only for getting the equipment but also for awareness raising in the business.

5.8.3 Phase 3-1 : Actions by Facilitator and Federal Government

(1) Continuous awareness raising within the government and publicizing activities

The facilitator holds regular meeting with the task force and the regional task forces to exchange and update information and ideas. Important issues are to be shared within the government. Awareness rising activities by the government are to be publicized by means of any existing media such as newsletter, news mail, notice board, website, and so on. Specialized website for the facilitator is to be established in the future.

(2) Continuous exchange of information with government's relevant sectors

The facilitator holds regular meetings with government's relevant sectors such as health, agriculture, etc. to exchange and update information and idea. Their relevant activities are also publicized and

included in the database.

(3) Continuous exchange of information with assist stakeholders

The facilitator organizes seminars and meetings targeting the assist stakeholders such as NGO (Women, Youth, Environment, etc.), media and university to share the information, to discuss the issues and to motivate them to embark on awareness raising. Findings obtained from the seminars will be utilized for the awareness rising activities. Questioners are also to be filled by the participants to update the database.

(4) Commercial program and website preparation for awareness raising in general public and business community

The facilitator organizes tender meetings with media and IT business in order to prepare TV/radio commercials and facilitator's website creation. The meetings are to take place in Lagos and Abuja. The booklet and the flier are to be used. For TV commercial, the video materials shoot by the study team can be used.

(5) Data collection on solar and PV business by questioner

Questioners are to be filled by related companies obtained from various meetings and seminars mentioned above. The database is updated with the information from the questioners.

(6) Expert meeting

The facilitator organizes expert meeting with participants drawn from universities, R&D institutions, specialized NGOs and media to discuss issues concerning the awareness raising. Finding and idea obtained from the meeting will be used for awareness raising for general public and general user. It is good idea to organize event and/or conference on specific day such as "World Environmental Day (5 June)" for example.

(7) Awareness raising in national assembly

Concerned federal ministries such as FMPS and FMST are to create awareness on solar energy and PV in policy/decision makers by taking opportunity in the national assemblies and other national meetings.

(8) Monitoring

Awareness raising is a set of numerous actions done by various stakeholders at various levels in various areas and sectors. The facilitator is needed to monitor the progress of awareness raising activities together with the progress of electrification and PV installation and update the database.

5.8.4 Phase 3-2 : Actions by State and Local Government

(1) User's seminars by state and local governments

When target areas for the PV electrification are selected, sensitization seminars are to be held for users in the selected area. If the target areas are not selected, the seminars are to be held in state capitals for general users. The seminars are to be organized by the regional facilitator at the

beginning but gradually trained staff of state/local government takes over the responsibility.

When electrification starts, more practical meetings and seminars are to be held and PV suppliers are also to be involved. These activities are covered in the following phase 4. Activities for formation of the village committee for maintenance are described in the chapter 4.

(2) Utilization of field survey for awareness raising

During field survey of villages to establish target village of electrification, the flier in local language prepared in phase 2 are to be given to village chiefs and leaders to create basic awareness.

(3) Continuous exchange of information with government's relevant sectors

The regional task force regularly holds meetings with state/local government and relevant sectors to exchange information on the progress of electrification and PV introduction. The progress is to be publicized and included in the database.

(4) Introduction of PV by the government

The regional task force encourages and recommends introduction of PV system by state/local government and relevant sectors' offices during meetings and seminars so that PV system will be exposed to many people. On the occasion of tender, the information booklet and the flier are to be distributed to interested suppliers. Questioners are also to be filled by those suppliers to update the database.

(5) Utilization of existing PV systems and project sites

For the awareness raising, state/local government and offices of relevant sectors are recommended i) to use existing PV systems in open manner, ii) to organize demonstration and to establish demonstration sites, iii) to organize study tours to the existing pilot project sites.

(6) Continuous exchange of information and idea with assist stakeholders

The regional task force organizes meetings with the assist stakeholders such as NGO (Women, Youth, Environment, etc.), media and university in the region to share the information, to discuss the issues and to motivate them to embark on awareness raising. Findings obtained from the seminars will be utilized for the future awareness rising activities. Questioners are also to be filled by the participants to update the database.

(7) Data collection on solar and PV business by questioner

Questioners are to be filled by related companies obtained from various meetings and seminars mentioned above. The database is updated with the information from the questioners.

(8) Awareness raising in state/local assembly

State/local governments are to create awareness on solar energy and PV in policy/decision makers by taking opportunity in the state/local assemblies and other meetings.

(9) Monitoring

The regional task force is to monitor the progress of awareness raising activities together with the progress of electrification and PV installation and update the database.

5.8.5 Phase 4-1 : Actions by State and Local Government for Users

This phase 4-1 contains awareness creation and raising actions for the people and communities in the areas selected for the PV electrification. This phase is a preparation for public to become a user and an introduction for the establishment of the operation and maintenance organization which is described in the chapter 4. Therefore this phase will be repeated in other areas to be electrified.

(1) Introduction to village chiefs, elders and leaders

State/local government organizes an introductory meeting with village chiefs, elders and leaders to explain that they are soon going to have PV systems. The booklet and the flier are to be used. If there is a community group or NGO, a leader of the group is also to join the meeting.

(2) Explanation to villagers

State/local government organizes meetings with the villagers together with the participants to the preceding meeting. During the meeting, PV systems are explained and voices from the villagers are heard to prepare for the establishment of operation and maintenance organization.

5.8.6 Phase 4-2 : Actions by State and Local Government for Business Community

This phase 4-2 contains awareness creation and raising actions for PV suppliers and installers for areas selected for the PV electrification. This phase proceeds simultaneously with the phase 4-2 and is repeated in other areas to be electrified.

(1) Explanation to tender appliers

Tender application documents are to be given with the booklet and fliers to the appliers. The questioners are also to be filled.

(2) Explanation to accepted suppliers

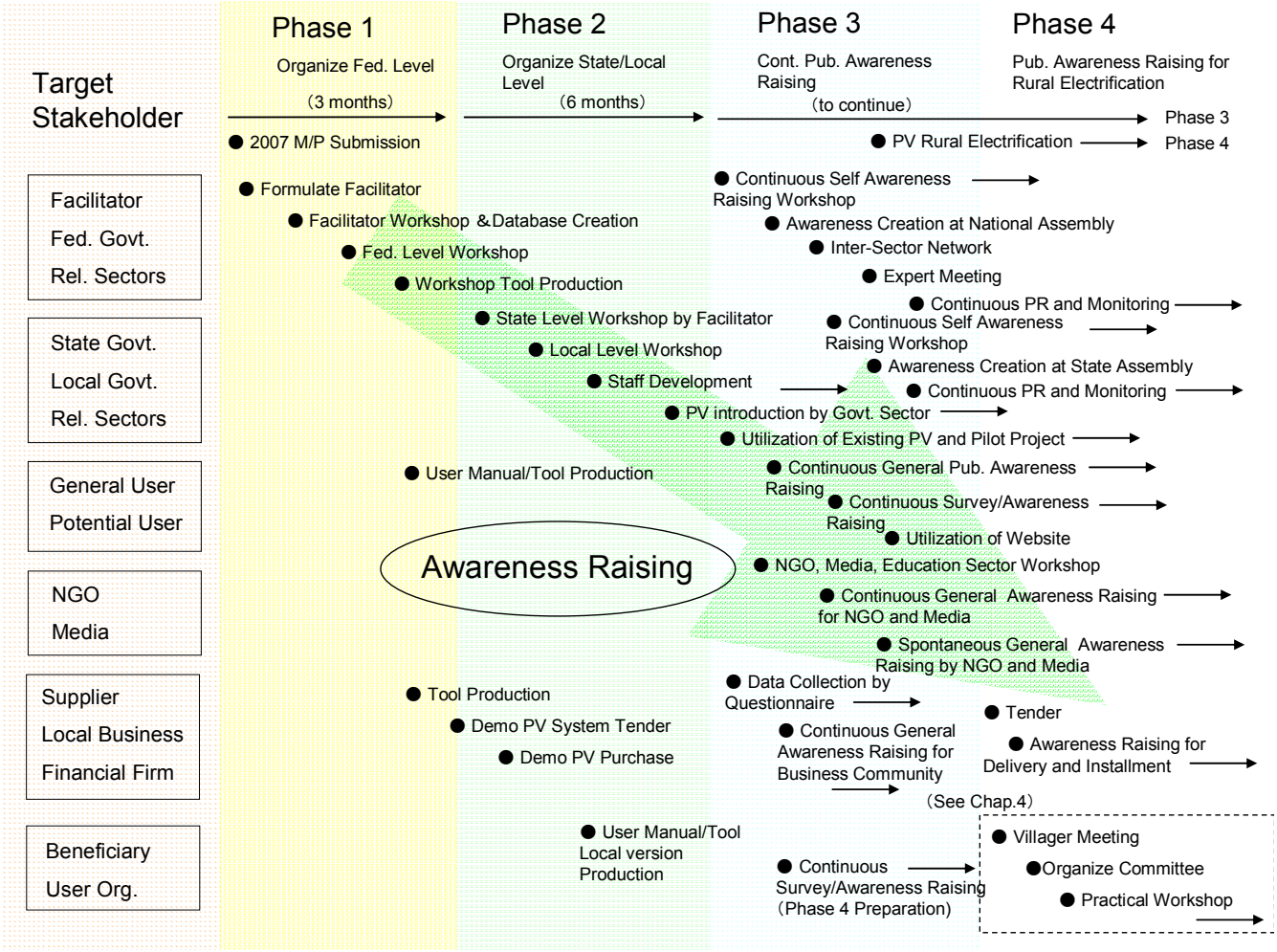
Detailed explanation and instructions are to be given to the accepted tender suppliers taking lessons learnt from the pilot projects into consideration.

(3) Awareness raising in local business community

State/local government, and operation and maintenance organization of the village are to have frequent meetings with local business community in order to start and maintain smooth operation.

5.8.7 Overview of the Actions

Fig. 5-4 shows overall view of the actions described so far. From the rural electrification point of view, actions progress from the capitals to the rural and from government sectors to private sectors. From the point of view of private sector driven market growth, active and spontaneous actions by all relevant stakeholders are important and the role of the facilitator to make such environment is here.



Source: Study Team

Fig. 5-4 Progress of Awareness Rising Actions

5.8.8 Genders in Awareness Raising

In awareness raising activities, gender consideration is relevant to all components of the activities such as stakeholders, topics and methods. It is important to include topics about gender consideration. Moreover since awareness is always created and raised through interaction of men (subject stakeholder) with men (target stakeholder), bringing about a physical presence of women in every awareness creation scenes is just simple but very practically useful poly in terms of gender consideration in awareness raising. The followings are some practical examples.

- Regarding the subject stakeholder, there must be female members in the facilitators and in the task forces. Also there must be female staff in relevant departments of state/local

government.

- Regarding the target stakeholder, gender consideration takes shape when we consider specific action targeting specific stakeholder. For example, in user's seminar in northern area where most people are Muslims, most women may stay at home during the daytime and hence they may not participate in the seminar. To cope with this problem seminar can be held in village women's center or village chief's residence by women organizers.
- Regarding the method, gender consideration takes shape also when we consider specific action targeting specific stakeholder. Just above suggested women's seminar by women is an example. Effect of women's presence in an event, on print media, on TV, and so on is to be always considered.
- Topics listed in paragraph 5.5 already include gender related issues. Awareness on the numerous benefits brought by PV and rural electrification to women is to be created widely.

5.9 Cost Sharing and Cost Effectiveness of Awareness Raising

Awareness raising is a complex of numerous activities done by many stakeholders in long period. Its importance is to be recognized by the government (this is one of most important topic to the government). Government must commit itself to the awareness rising with appropriate financing policy agreed by responsible stakeholders.

5.9.1 Phase 1 and 2

REA has been just established and the reform of power sector is still in progress. Actual PV rural electrification program including a budget will be worked out shortly from now. Awareness raising is a supporting and background activity of rural electrification. Therefore phase 1 and 2, which are the preparatory process, are supposed be complete before the commencement of the electrification. In this regards costs for actions in the phase 1 and 2 are to be shared by the existing budget. The following policies are proposed.

- Costs for phase 1 and 2 are mainly shared by FMPS, FMST and ECN.
- Main activities in phase 1 and 2 are the workshops. Therefore existing systems, services, facilities and human recourses are to be utilized fully. Each ministry is to offer these facilities and resources as much as possible as their commitment.
- Reasonable level of honorarium and transport for the resource persons of the workshops are to be shared with the ministries. The resource persons are to be sought internally as much as possible.
- Participation costs, such as transport, of federal ministry staff to the workshops held in Abuja are to be born by the home ministries. Venue should be meeting room or conference hall of the ministries.
- Mission costs, such as transport and accommodation, of federal ministry staff (the facilitator) to the workshops held in state/local capitals are to be born by the home ministries. Venue should be meeting room or conference hall of the state/local government.
- Participation costs, such as transport and accommodation if necessary, of state/local

government staff to the workshops held in state/local capitals are to be born by the home government. Venue should be meeting room or conference hall of the state/local government.

- Stationery is to be responsibility of the participants.
- Costs for paper and printing for the tool production are to be shard by the federal ministries and state/local government depending on the purpose.
- Purchase of PV system for the demonstration is optional. If the purchase is difficult due to a lack of funds, the purchase is considered in the phase 3.

5.9.2 Phase 3 and 4

Phase 3 and 4 are parallel activities with the electrification. Budgets for awareness raising from REF are to be allocated for the actions and distributed to each responsible stakeholders for that purpose with coordination by the facilitator. However every ministries and state/local governments are also expected to initiate its own awareness raising activities in accordance with their own policies and priorities. The facilitator is to monitor these activities.

5.9.3 Cost Effectiveness of Awareness Raising

Awareness raising deals with the information. Therefore its cost is very reasonable in comparison to the cost of the electrification which deals with materials and equipment.

In the Renewable Energy Master Plan (REMP) of ECN and UNDP, the importance of the awareness raising is well recognized and mentioned in every chapter. In the national solar energy program for 20 years from 2005 to 2025 of REMP, the budget for the awareness raising is Naira 70,000,000 while the total budget is Naira 6,975,000,000. Awareness raising occupies only 1% of the total budget.

In this action plan, awareness raising activity is defined as a part of the capacity development. There is a report stating that a capacity development costing just a few percent of the total cost may have a key to success of project[5].

Last not but least, we wish to raise awareness among the government of this importance of awareness raising.

[5] IEA PVPS Task 9, Report T9-03 (2003), PV for Rural Electrification in Developing Countries – A Guide to Capacity Building Requirements

Appendix 1 Member List

Name	Work Assignment	Present Post
Mr. Nishikawa Mitsuhisa	Leader /Rural Electrification・Distribution Planning 1	Yachiyo Engineering Co., Ltd.
Mr. Saitou Kensuke	Solar Energy Utilization 1	Electric Power Development Co.,Ltd.
Mr. Ogawa Tadayuki	Solar Energy Utilization 2 / Distribution Planning 2	Yachiyo Engineering Co., Ltd.
Ms. Uramoto Mihoko	Social survey/Environmental and Social Considerations / Gender Consideration	RECS International Inc. Planning & Management
Mr. Shimizu Tadashi	Pilot Project Management / Participatory Development	RECS International Inc. Planning & Management
Mr. Takahashi Kenji	Economic and Financial Analysis	T. & Associates L.L.C.
Mr. Wakabayashi Masahiro	Public Awareness Raising - 1	RECS International Inc. Planning & Management
Mr. Tanaka Kiyofusa	Public Awareness Raising - 2	Yachiyo Engineering Co., Ltd.
Mr. Urano Katsuo	Research & Development	KET Kankyo Energy Tech
Mr. Yatsu Tetsuo	Coordinator	Yachiyo Engineering Co., Ltd.

Appendix 2 List of Parties Concerned

Federal Ministry of Power and Steel (FMPS)

Hon. Liyel Imoke	Minister
Hon. Ahmed Abdulhamid	Minister of State
Engr. H. Nggada	Director (Electrical Inspectorate Services)
Engr. Sanusi Garba	Director of Power
Engr. O. O. Oyeneye	Former Director of Power
Mr. A.I.Nnamani	Director, Personnel Management
Ms. O. A. Badejo	Chief Press Secretary to the Honorable Minister
Engr. Yusuf A. Fwankat	Principal Engineer
Engr. S. A. Owolabi	Senior Engineer
Engr. Philip Okpanefe	Senior Engineer
Engr. Eneh K.I.	Senior Engineer
Engr. Eugene Ejeregbe	Senior Engineer

Federal Ministry of Science and Technology (FMST)

Dr. Abdullahi Aliyu	Permanent Secretary
Mr. Ayodele Omowumi	Director
Dr. M. A. N. Ejiofor	Director, Science and Technology Promotion Department
Dr. J. A. Aremu	Director, Industrial Technology & Energy Research Department
Mr. Muhammad Zakari	Director, Personnel Management
Mr. A.O. Oyefeso	Chief Scientific Officer
Mrs. Stella C. Igwilo	Senior Scientific Officer
Mr. Clement E. O. Egbeama	Chief Press Secretary to the Honorable Minister

Energy Commission of Nigeria (ECN)

Prof. A.S. Sambo	Director General
Engr. J.O. Ojosu	Director (Energy Planning and Analysis)
Dr. E.J. Bela	Director (Renewable Energy Development)
Engr. Abaka A.U.	Senior Scientific Officer
Mr. G. H. Nayaya	Head of Media Unit to the Director General

Sokoto Solar Energy Research Center

Prof. B. Garba	Director
Dr.M. Aluyu	Leader of Small Hydro Power Unit
Dr.B. G. Daanshehu	Leader of Solar Thermal & Wind Energy Unit
Mr. G. Saidu	Leader of PV Unit
Ms. A. D. Tambawl	Leader of Biomass Unit
Mr. G. M. Argungu	Leader of Meteorological Unit
Mr. L. U. Kangiwa	Leader of Mechanical & Carpenter Workshops

Appendix 2 List of Parties Concerned

Nsukka Energy Research & Development

Dr. O. U. Oparaku	Director of Energy Research and Development
Dr. G. O. Unochnkon	Head of Energy Efficiency
Dr. W. I. Okonkwo	Head of Solar Thermal
Dr. G. I. Ege	Head of Biomass
Mr. C. D. Ogbonnia	Chief Technology Office
Mr. Paulinus Ugwuoke	Researcher of PV Unit

National Planning Commission (NPC)

Mr. Ayodele Omotosa	Coordinating Director
Mr. A. M. Bachaka	Assistant Director, Multilateral Aid Division
Mr. R. O. Showole	Chief Planning Officer, Bilateral Aid Division
Mr. U.S. Nwozuzu	Principal Planning Officer

Rural Electrification Agency (REA)

Mr. Sam I. Gekpe	CEO
Engr. L.K. Orekoya	Director (Projects)
Mr. Isa Ya'u Dunari	Director (Promotions)

Federal Ministry of Women Affairs

Dr. Habiba Muda Lawal	Director, Women Affairs

Federal Ministry of Environment

Dr. N.G.Ekeh	Deputy Director, EIA Division
Mr. John Alonge	EIA Division

Power Holding Company of Nigeria (PHCN)

Engr. W.O. Emenike	Asst. General Manager (Projects)
Engr. A.B.Mohammed	Senior Manager (Performance Management)

National Bureau Statistics

Mr. C.A. Okafor	Asst. Chief, Gender and Development Unit

Jigawa Alternative Energy Fund (JAEF)

Mr. Muhammad Sani Muhd	Executive Secretary
Mr. Shefu Muhd Hadejia	Director of Administration and Finance
Mr. Alh. Musa Mohammed	Solar Site Manager
Mr. H.H. Hassam	Manager Biogas
Mr. A.U. Gumel	Electrical / Accountant

Mr. B.U. Aujara	Public Relation Officer

Ondo State Electricity Board (OSEB)

Engr. K.O. Temikotan	General Manager
Engr. R.O. Omodara	Director
Engr. Olusa Vincent	Engineer
Engr. Akintunde Fredrick	Engineer
Engr. Bolawale Stephen	Engineer
Engr. Kebu Philips	Engineer

Akure North Local Government

Mr. Dele Fagoriola	Chairman

Ngor Okpala Local Government

Chief Emma Ohakpugwu Nwaogu	Chairman

Power Holding Company of Nigeria (PHCN Dutse Business Unit)

Engr. A.M. Hadejia	Business Manager

Power Holding Company of Nigeria (PHCN Ondo Business Unit)

Engr. F.M. Sadiku	Business Manager

Power Holding Company of Nigeria (PHCN Owerri Business Unit)

T.C. Ilokah	Business Manager
E.I. Chuku	Technical Engineer

Power Holding Company of Nigeria (PHCN Abuja Zonal Office)

Engr. E. O. Ikwu	Chief Operating Officer
Engr. S. O. Agbo	Principal Manager (Planning & Construction)

Public Utilities and Rural Development (PURD) in Imo State Government

Barr. Noel A. Chakwukadibia	Commissioner
Arc. E.O. Thekwaba	Permanent Secretary
Engr. F.A. Akuchie	Director
Engr. Ugho J.	Engineer
Mr. Frank Eke	Principal Technical Officer
Mr. Victor Nnodimele	Principal Technical Officer
Mr. Levi Ntagbu	Principal Technical Officer

Federal Capital Territory Administration (FCTA)

Mr.Nasir Abmad el-Rufai	Minister of the Federal Capital Territory
Dr.Abdu Mukhtar	Special Assistant to the Minister
Mr. Musa Shemu	Social Development Secretariat, Community Development Division

United Nations Development Programme (UNDP)

Mr. Emmanuel Oladipo	Assistant Resident Representative (Programme)

United Nations Industrial Development Organization (UNIDO)

Mr. Jossy M. Thomas	Industrial Development Officer (Energy)

United Nations Children's Fund (UNICEF)

Mr. Othiniel N.Habila	Project Officer (Water and Environmental Sanitation)
Mr. Kenneth Ozoemenam	Gender Officer

World Bank

Mr. Hafez Ghanem	Country Director

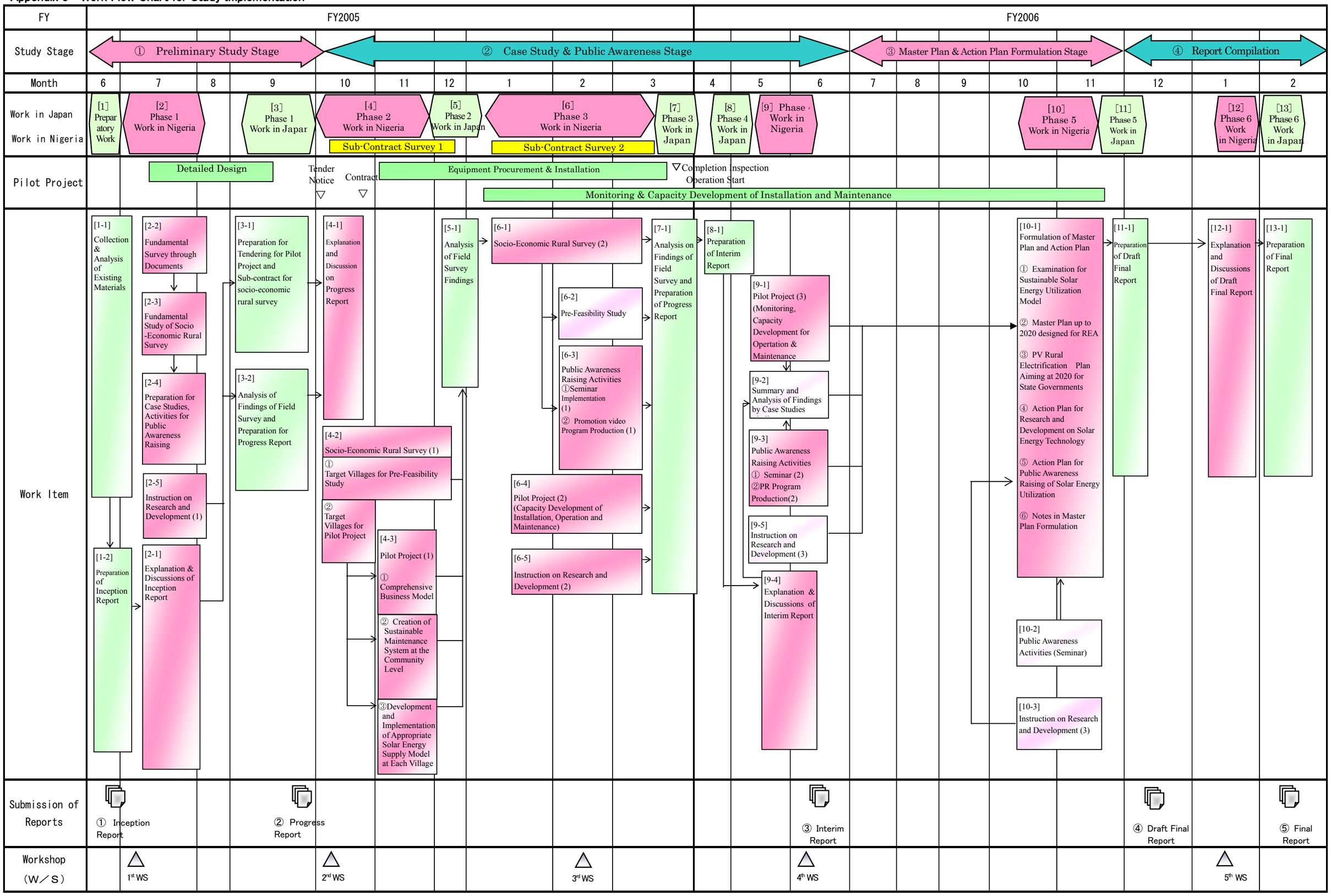
Embassy of Japan in Nigeria

Mr. Akio Tanaka	Ambassador
Mr. Seisuke Narumiya	Minister-Counsellor
Mr. Yoshimasa Iwata	Former Minister-Counsellor
Mr. Shintaro Kitagawa	First Secretary
Mr. Yasuhiro Yamauchi	Second Secretary

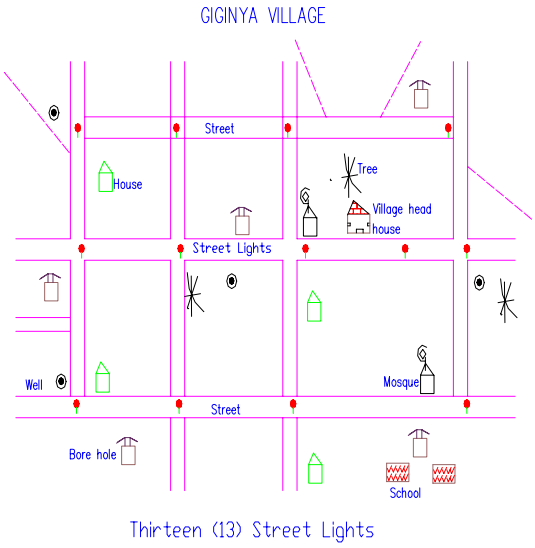
JICA Nigeria Office

Mr. Shigeo Yamagata	Resident Representative
Mr. Kuniaki Amatsu	Assistant Resident Representative
Ms. Kiyomi Kaida	JICA Expert on Gender and Development
Mr. Ozuruoke Kingsley	Administrative Officer
Mr. Sowunmi O. Isaac	Administrative Officer
Mr. Bashir Ibrahim	Security Adviser

Appendix 3　Work Flow Chart for Study Implementation



Jigawa State



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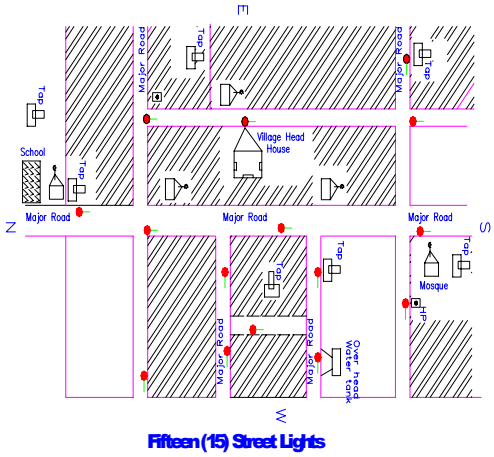

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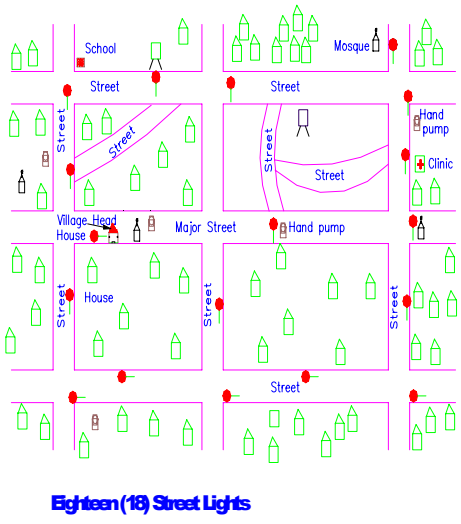
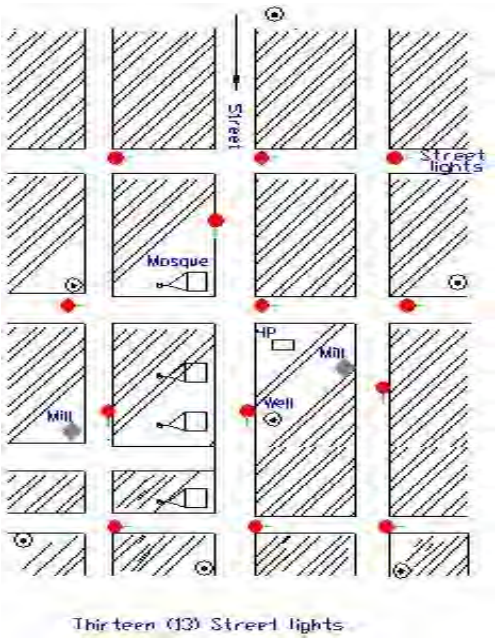


J-103 Jarmari



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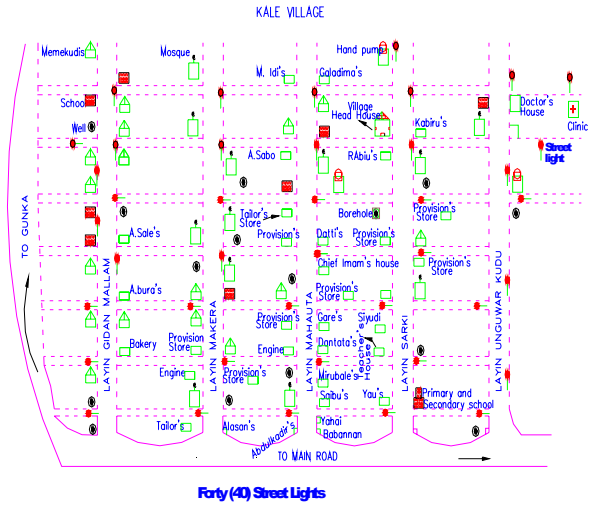
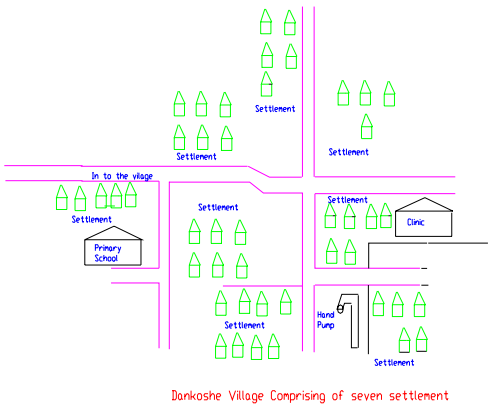
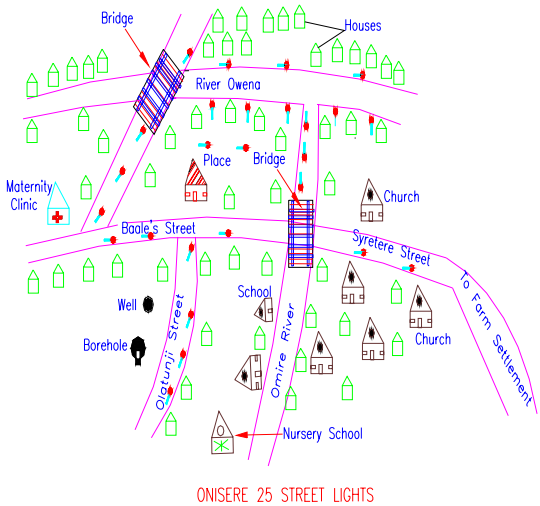


J-105 Kale Hayintara

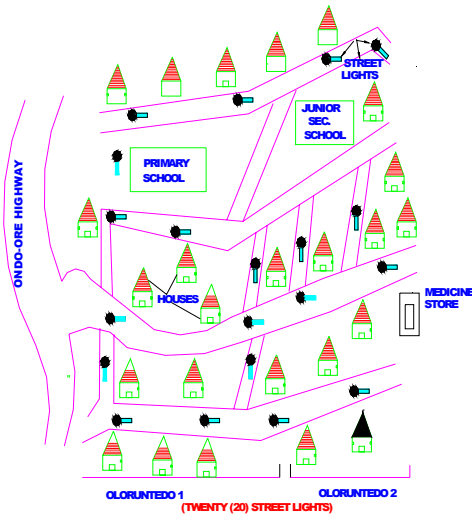


J-106 Dankoshe

Ondo State



O-101 Onisere



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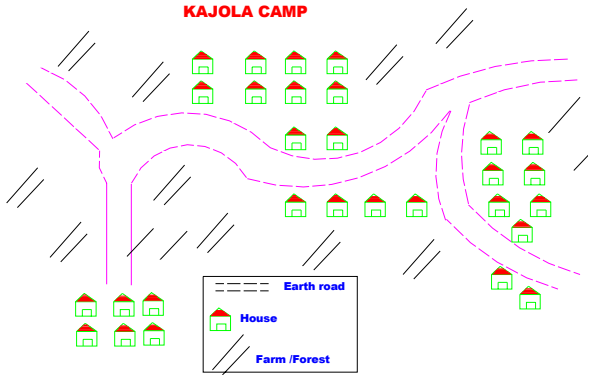

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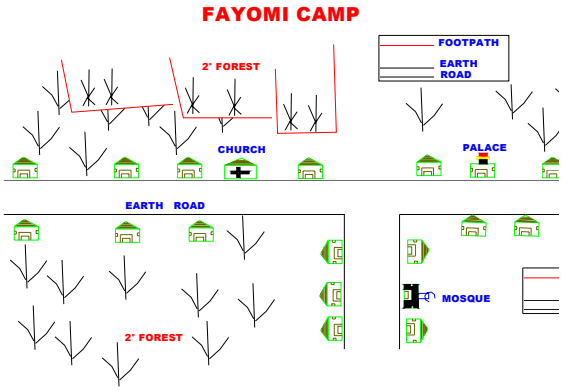

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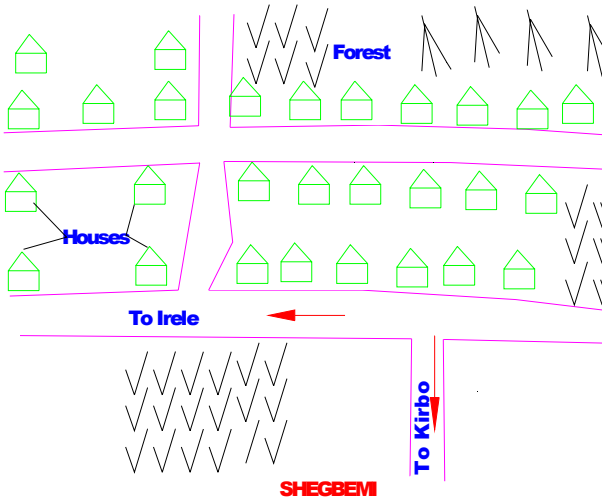

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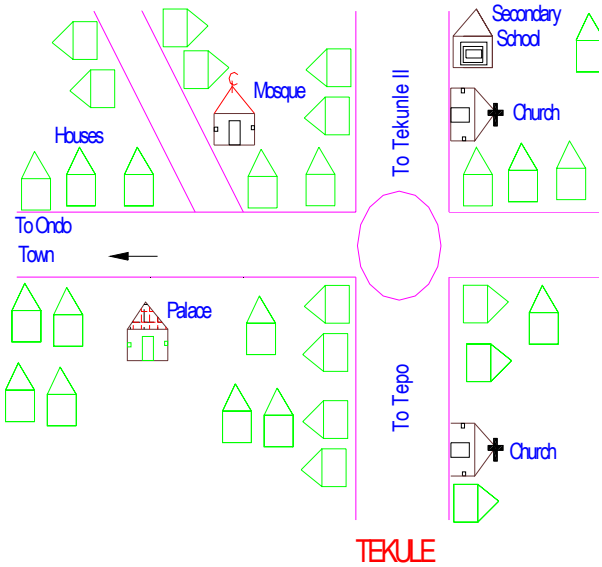
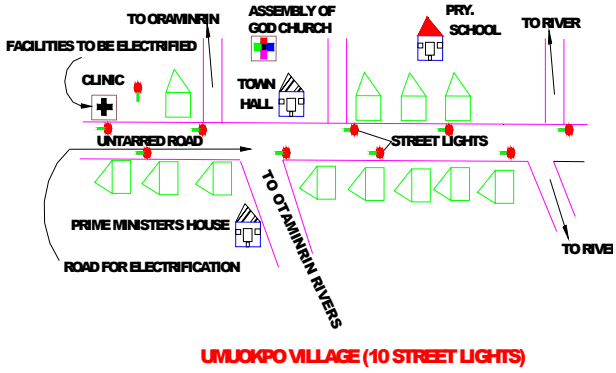


O-106 Tekule

Imo State



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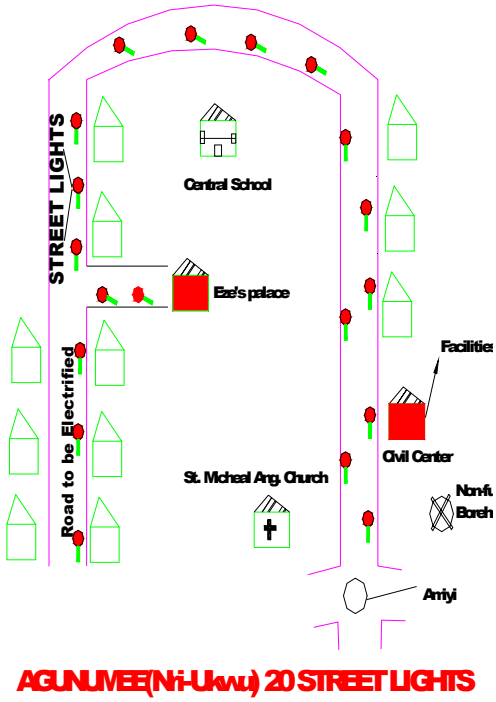

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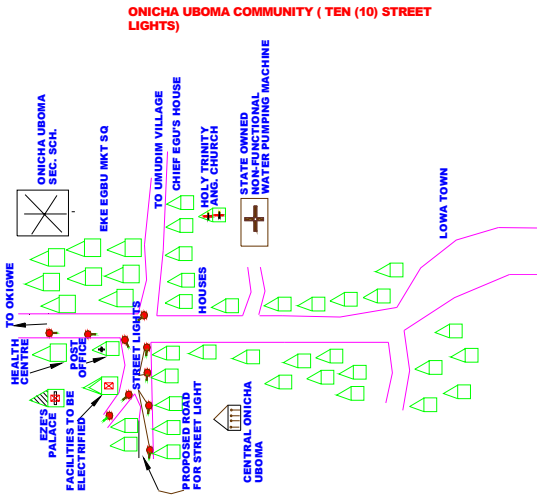

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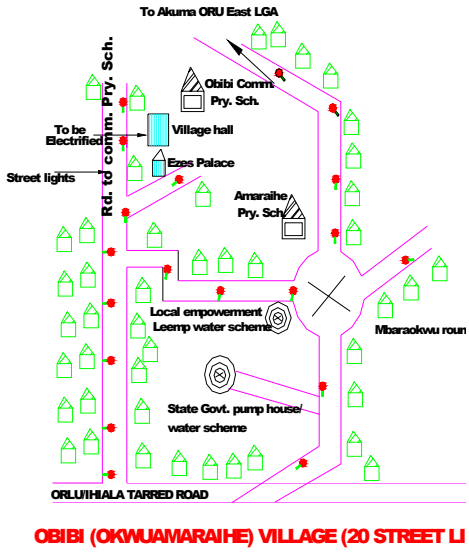
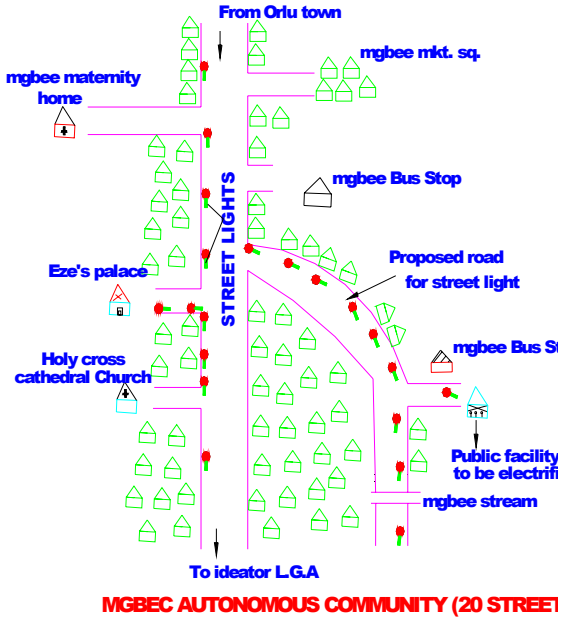
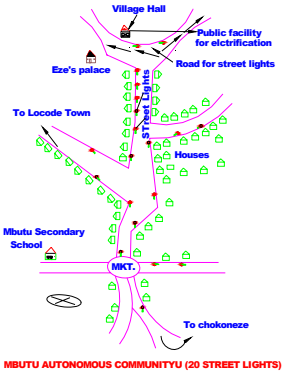


I-104 Obibi (Okwuamaraihe)

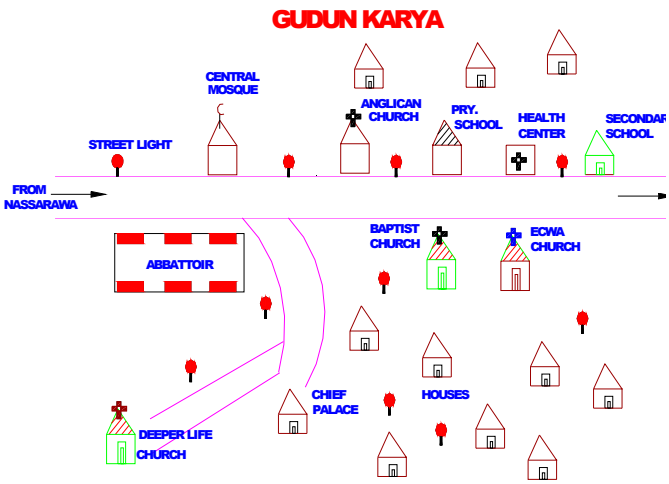


I-105 Mgbee

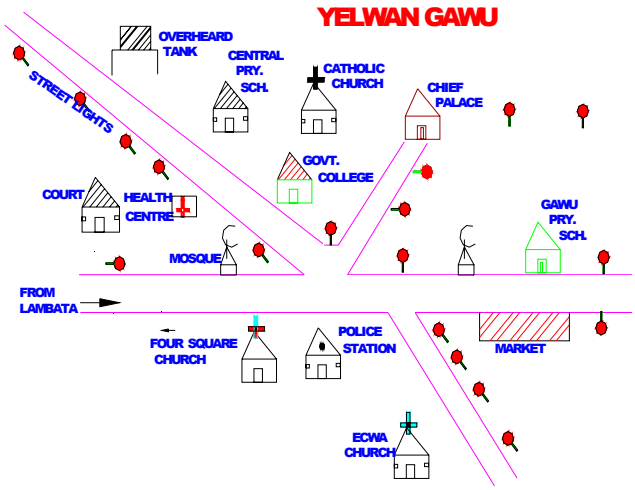


I-106 Obokwu (Mbutu)

Federal Capital Territory (FCT)



F-1 Gudun Karya



F-2 Yelwan Gawu