

# Six days in Ouagadougou

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Wednesday, 20 April 2011

NAKANO Yukinori  
Convenor of CRIOR

# Aim of the research in CRIOR

- ◆ CRIOR stands for «Centre de recherches sur la coopération internationale pour la promotion de l'utilisation des ondes radio en Afrique de l'Ouest».
- ◆ CRIOR's aim is to create the BOP business to promote the use of the radio waves through non profit use by the citizens, recommended by ITU-R; M. 1043-2 (2003), to reduce the digital divide in West Africa, namely in Burkina Faso.

# Method of CRIOR Field Work

- ◆ Accumulation of general information and our experience in Burkina Faso to proceed further international cooperation.
- ◆ The list of the field work research activities, selected and applied from the CRIOR articles, is shown as following;
- ◆ (1) Looking for local partners to proceed “[courses to give a lecture on the non-commercial use of radio waves](#)”, in local universities, in high schools and also in junior HSs.
- ◆ (2) radio amateur operation,
- ◆ (3) general observation of the electrical power supply, internet access and mobile phone services,
- ◆ (4) demonstration of private WiFi-WDS open intra-network, the open tiny client systems; Ecolinux, thin-client server system, etc.

note: Thinking international cooperation in a developing country, we must prepare and use lawful software. For this reason, we have developed our proper Linux software. Mr. Nishio and Miyawaki have refined ubuntu to get Ecolinux and thin-client Linux server system for our use.

# Theoretical Interpretation

- ◆ The economy development is propelled by the endogenous technological change (ETC).
- ◆ The ETC is accelerated by promoting the exchange or the diffuse of knowledge or information of ICT amongst the local people.
- ◆ ETC is composed of the scientific technological change and also the “bricolage” techniques or skills change.
- ◆ We propose, in this research project, an international cooperation to create the local platform to proceed the “bricolage” techniques or skills change.
- ◆ Japan and Burkina Faso bilateral field work provides services to younger generation to let them find proper interests in voluntary radio frequency use or development.
- ◆ This kind of self-convinced interests promotes local BOPs!

# Field Work Members

- ◆ NAKANO Yukinori, JA3VWT, Professor, Convener of CRIOR, member of JL3YJF
- ◆ TOJO Junichi, JH3AEF, Medical doctor, member of i-House Radio Club (JI3ZAG)
- ◆ NAKATA Shusuke, JO3VVO, Research Assistant for CRIOR, member of JL3YJF
- ◆ NISHIO Minoru, JO3XYZ, Student, Research Assistant for CRIOR, member of JL3YJF

# Local program

- ◆ Enter in Ouagadougou in the evening of Tuesday 22 March. Staying at Hotel Eden Park.
- ◆ Rendez-vous with Ambassador Sugiura in the morning of Wednesday 23. Having changed Hotel and located in Palace Hotel near from Japanese Embassy, we were a little bit confused by seeking vacant rooms with WiFi global access.
- ◆ All appointments for the afternoon of 23 were canceled because of the incident of military riot in the centre of city through the midnight of 22.
- ◆ So, we visited JICA/JOVC office to see Mr. Kondo to exchange information and to see Mr. Mawatari.
- ◆ Setting up the amateur radio station at the house provided in Ouagadougou through 23 and 24.

# program (continued)

- ◆ Radio amateur operation from 24 to 27 March. Only 37 hours electricity supply for the first 3 weekdays.
- ◆ Visit the INSD, Mr. OUATTARA in the afternoon of 24.
- ◆ Visit DGEP, MEF, Mr. BASSOLET and University of Ouagadougou, Prof KOULIDIATI and Prof TALL in the afternoon of 25.
- ◆ Demonstration of WiFi-WDS network, Ecolinux and thin-client project on 26 and 27 March.
- ◆ Departure from Ouagadougou to Paris in the evening of Sunday 27 March.

# Experience of voyage to BF

- ◆ To enter in BF, we had difficulty for obtaining VISA because of the sudden close down of Embassy of BF in Tokyo, just after the Nord-East Japan Earthquake Disaster.
- ◆ The air ticket fair was from 210,000yen to 300,000yen from Osaka to Ouagadougou.
- ◆ A five stars hotel in Ouagadougou costs 10,000yen per person at least. Palace Hotel was so good to sleep without souci.
- ◆ It was very fine but with smog of fine sands.
- ◆ Temperature was 28°C in the night and 45°C in the afternoon.
- ◆ The season was dry and less mosquito.

# Palace Hotel



Photos taken by Mr. Nishio

# General economic situation

- ◆ Economic growth rate reached 6% but the GDP per capita, about 600 dollars, keeps the lowest rank in the developing countries list.
- ◆ The foreign assistance covers about 10% of GDP according to the statistics published by DGDS.
- ◆ Main industries are agriculture, commerce and public service, very little activities in manufacture. Transport and energy are not increased for recent 5 years.
- ◆ BF imports energy from neighbour countries. Import ratio of electricity is about 18% in 2009. Turmoil of Côte-d'Ivoire decreases the electric power supply.
- ◆ Many FM local stations, 500W to 1kW, but less TV stations.
- ◆ Public infrastructure, such as national road, electric power grid, is not sufficient to cover whole territory.

# (1) Looking for partners in BF

- ◆ University of Ouagadougou
- ◆ DGEP, Economy and Planning Bureau
- ◆ JICA/JOVCV Burkina Faso Office
- ◆ Association of radio-amateur, BF
- ◆ Japan Burkina Faso friendship association

# University of Ouagadougou

- ◆ Having seen Pr TALL, we explained our five-year cooperation programme with the documents of CRIOR.
- ◆ He has agreed with our idea to give co-lecture for promoting ICT use in his University, and he told us that a professor of “Sciences Exactes et Appliquées” Faculty is about to discuss the international partnership to proceed his education and research activities. Unfortunately, the campus was closed so that we could not meet this professor.
- ◆ We insisted that our future partners would not be limited in the scientific faculty but in the “Sciences Humaines” faculty.
- ◆ President of University of Ouagadougou, Professor Koulidiati has shown us his personal interest in our bilateral proposals and called attention to other vice-presidents to prepare adequate body to receive us in his University.

# University of Ouagadougou



# Economy and Planning Bureau

- ◆ We have met general director of DGEP, Mr BASSOLET on 25 March.
- ◆ He explained to us the national economic programme and stressed the importance of ICT education and training.
- ◆ He invited us to make contact to the National Education Ministry to ask them potential adequate partners for our future bilateral cooperation.

# DGER, M. BASSOLET



# Local office of JICA/JOCV

- ◆ We have met Mr. Kondo, officer of JICA/JOCV Burkina Faso Local Office.
- ◆ He has shown us his personal interest on our radio use promotion project.
- ◆ Mr. MAWATARI, JOVC agent in TENKODOGO, has engaged in our project and he expressed his intention to propose WiFi-WDS and Ecolinux project to his local partners.
- ◆ Mr. Nishio explained to him his Ecolinux and thin-client technology with his CD-ROM in details in the car because we used electric power from the car.

# M. Mawatari, member of JOVC in BF



# Association of radio-amateur, BF

- ◆ President of ARBF, Mr. POODA has given us a lot of favour to obtain our local licenses and to operate our radio-amateur station under comfortable condition.
- ◆ His local agents helped us building the antennas.
- ◆ We deeply hope that ARBF rests the most important local partner.

# One of our licenses of the radio-amateur in XT2



# Accommodations of our radio-amateur station



## Japan Burkina Faso Friendship Association (JBFA) and International House of Osaka (i-House Osaka)

- ◆ NAKANO is a member of JBFA and i-House in Osaka.
- ◆ i-House Radio Club, JI3ZAG, has helped us a lot for preparing Rigs and operation skills of radio-amateur station. Dr. Tojo has joined us as a senior trainer of radio-amateur. He was content very much with the local radio-amateur operation in Ouagadougou.
- ◆ Mr. Iida is a local representative agent of JBFA and he manages his proper Japanese restaurant, “Wagaya”, in Ouagadougou.
- ◆ We were helped and supported by him and his agent, Mr. Ab-san, Abdoulaye Ouedraogo, a driver and a business consultant in Ouagadougou.
- ◆ We asked Mr Iida to keep our WiFi rigs in his house and he has promised us to keep them safe till next project.

# Wagaya, local Japanese restaurant



Photos taken by Mr. Nishio

## (2) Radio-Amateur activities

- ◆ Operation of local HF radio-amateur stations,
- ◆ Operation of mobile UHF radio-amateur stations.

# Operation of HF radio-amateur station

- ◆ We started operation at 16:40 in the afternoon of 24 March and ended about 16:00 of 27 March.
- ◆ Operator is Dr. Tojo, XT2AEF. He ran it all night of 24. Sub-operators are Mr. Nakata, XT2VVO, Mr. Nishio, XT2XYZ and Pr. Nakano, XT2VWT.
- ◆ The electric power supply was very unstable. Only 37 hours supply was confirmed to operate 581 QSOs for first 3 week days by XT2AEF.
- ◆ The propagation condition of HF radio wave was not so good and a few hours per day permitted us to have a contact with DX stations.
- ◆ According to the log book of XT2AEF, he covered all global stations from Asia to America, but not from Australia nor New Zealand. The number of communicated Japanese radio-amateur stations reached 12.

# Operation of XT2AEF (video)



# XT2AEF / JH3AEFレポート

**JI3ZAG**  
Osaka I-House Radio Club

Newsletter  
April 2011

## 金魚の糞 XT2AEF

東条純一 JH3AEF

### 要旨

今朝XT2から閑空着、遅刻しましたが今朝から 平常の生活を始めています。

熱射にも負けず、お腹こわしもせず、マラリヤにもかからず(これは未だ予防服用は続きますが)先ずは普段と変わらない感覚です。ご安心ください。

まあ大変な国でした。到着した夜には軍内部で紛争がおき、夜間街中で銃撃戦があり、夜間外出禁止令が出ていたとか。我々は花火や、お祭りか?ですから平和ボケも良いところですよ。

大統領か首相か判りませんが偉そうな人物が延々とTV演説をして解決はしたものの、我々の間では直ちに帰国すべきかなどの話も出ました。そんな馬鹿など思いながらも、翌日、街が何事も無かったように平常どおり動き出しほっとしました。

その次は暑さ、先ず太陽がかげることはありません。日中の日向は45度前後、ANT作業などは15分も続けると口の中がカラカラになりしゃべれなくなります。タワー等炎天下にある金属は素手ではとても熱くて触れません。

水は各自自分の分を確保。水道水は飲みません。また、蛇口をひねっても勢い良くは出てくれません。

最大の難関は停電です。お構い無しにプツンと切れます。

24日16:48~20:20 25日06:28~08:55, 09:40~09:45, 22:58~26日02:25 26日06:02~13:30, 15:48~18:15

この間しか送電されませんでした。こちらは運用可能な状態でも3日間で37時間しか電源がありませんでした。コンタクト中でも突然プツンです。

Rig.は IC706+TOKYOOhp HL550FX500W+ MINIMULTI HX52A IV 40m IV 75m + アルインコDM330MV のline upで出ました。従免は日本国内の従免に相当の資格で30日間有効。

お世話になった方が通信関係の仕事をなさっていて、現用していないステーションの17~8cm角の細身のタワー12mHを提供してくださいました。ステーが沢山張られていてビームANTの上架、回転には不向き、あらぬ方向へ固定しかできませんでした。XT2AEFは18, 21, 24MHz PHONEで570局少々のQSOをはたしました。JAとは5局できたと思っています。

JAの音が聞えると、つい喉がつまって声が震え、涙目になりました。めめちくちくいやですね。逆に STANBY EU は気持ち良かったHi WPXはpediには不向きでした。

震災のこともあり事前に公表という手段はあえてとりませんでした。report をみてDaily DxのW3URのBernieがreportを求めてきていますので各人の情報を送る予定です。DxccのDeskにもlicenseのcopyを送りcontactがcountされるよう手続きをとります。QSLカードはこれから準備します。出来るだけ大判振る舞いで発行したいと考えています。

(出典: 東条純一、金魚の糞、JI3ZAG Newsletter、April 2011)

<http://www.ji3zag.net/pdf/ZAG-NL1104.PDF>

# Operation of XT2VVO

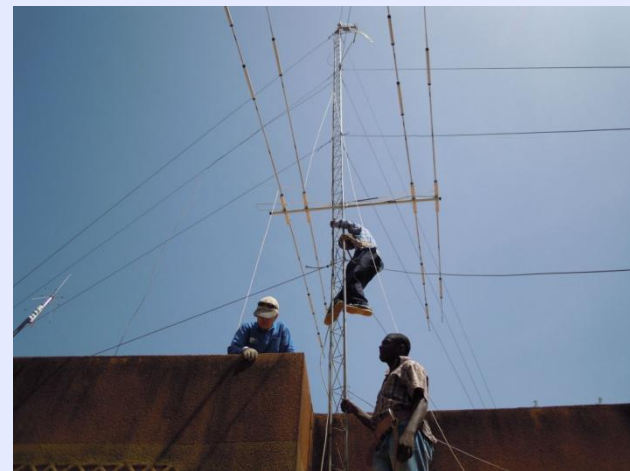


Photos taken by Mr. Nishio

# Setting up the antenna



# Rigs and antennas of XT2



# Set up members of radio station



# Operation of mobile UHF radio-amateur stations

- ◆ We used 435MHz radio-amateur band for local communications.
- ◆ No other signals were detected in the centre of Ouagadougou. No QRMs, no QSNs.
- ◆ We have confirmed our local QSOs with RS 45 to 59 at the distance of 2 km in the city with VX-8 (5watt portable transceiver).
- ◆ One station was in a passengers car and another was located in the House provided by Mr. POODA.
- ◆ We did not try “Echolink” because of the difficulty of the continuous global access use of the Internet.

# Mobile radio-amateurs rig with GPS



Photos taken by Mr. Nishio

### (3) General communication services

- ◆ Internet access,
- ◆ WiMAX services,
- ◆ Mobile phone services.

# The internet access

- ◆ We have faced big problem to make global internet access at the hotel.
- ◆ The intranet service was served even at the electric cut-off at the hotel, but we could not use any global internet service because of the blackout of town.
- ◆ The global internet access service to the hotel seems to be served via WiMAX not via metal-based ADSL nor 3G mobile telephone, because we could use mobile phone under blackout sometime.
- ◆ This point is confirmed by the statistics of ITU which says metal-based telephone service covers only about 15% clients in 2009.

# Intranet access in a hotel of Ouagadougou

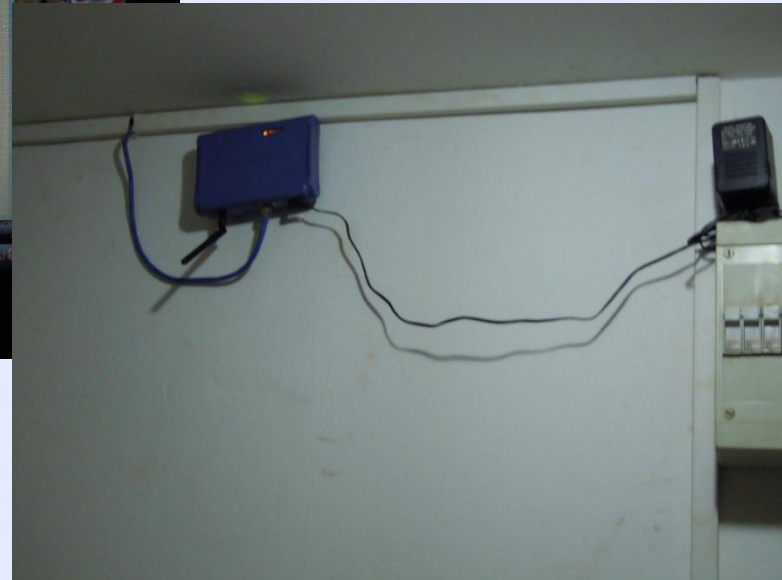
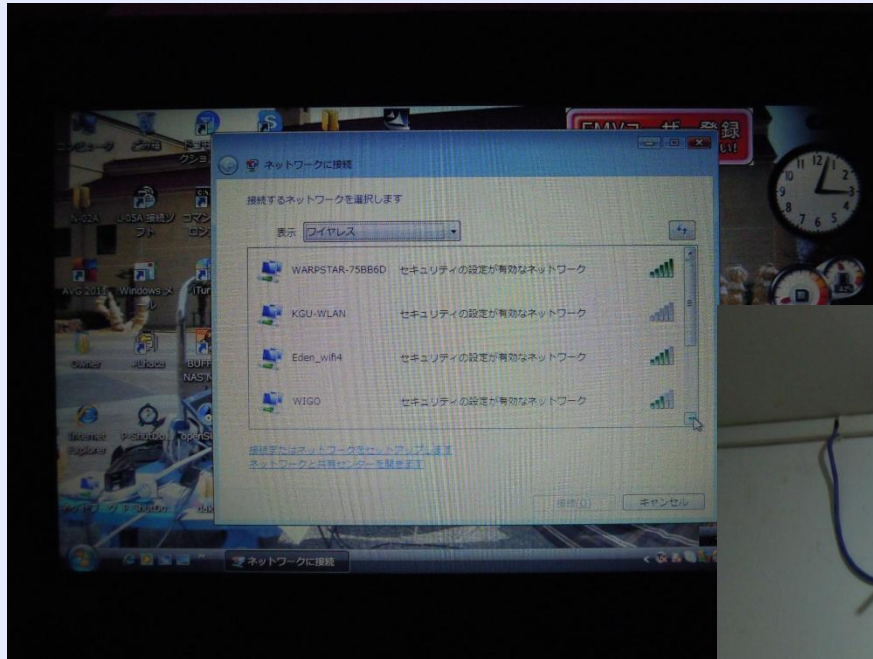


Photo taken by Mr. Nishio

# WiMAX services

- ◆ We visited a local enterprise working in the wireless activities in Ouagadougou.
- ◆ They have shown us the Cisco's WiMAX rigs with antennas.
- ◆ I saw exactly the same Cisco's rigs at the Moroccan private communication service company in last September (2010) so that this technology is seemed to be diffused in West Africa.
- ◆ WiMAX shows us the superiority for universal service for broader internet access with lower installation cost.

# WiMAX at a small company



# The mobile phone service

- ◆ There are three mobile telecom companies in BF. We bought an Airtel mobile phone at a roadside shack.
- ◆ Airtel is a brand of Indian telecom company which bought Celtel (Zain) in June 2010.
- ◆ The price was 20,000CFA (about 4,000yen) for a NOKIA's 2G (GSM) mobile phone, with 2 telephone numbers.
- ◆ They said a telephone number was sold at the price of about 500CFA. This is a system called SIM-free.
- ◆ The prepaid charge card was available from 500 to 5000CFA.
- ◆ 99% of mobile phones in BF are sold under prepaid contract according to statistics of ITU.
- ◆ When blackout occurred, there was no mobile phone service in certain area of the city. It depends on the area and the time, not assured but less rupture than WiMAX.

# Roadside shack for selling mobile phones



Photos taken by Mr. Nishio

## (4) Demonstration of non-profit radio use

- ◆ WiFi-WDS network,
- ◆ Ecolinux project,
- ◆ Thin-client server system.

# WiFi-WDS network

- ◆ We carried the antennas and WiFi equipments to Burkina Faso from Osaka to have a chance to demonstrate the testing of WiFi-WDS network in the campus of University of Ouagadougou in front of students and professors.
- ◆ But the government ordered local students limit off the campus and we decided to scale down this project.
- ◆ We, Mr Nishio, has prepared the WiFi-WDS network at the garden of the house, where our radio-amateur station was set up, and explained it to Mr Mawatari, local member of JICA/JOCV and also to the agents of a small local company of wireless activities.
- ◆ Because of the blackout of electricity, Mr Nishio set up the WiFi-WDS network of which electricity was provided by the batteries of our car.

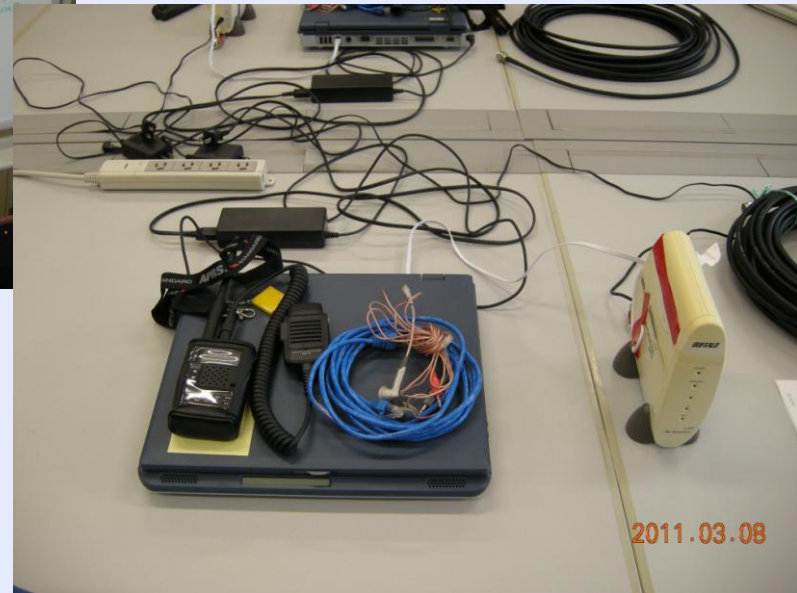
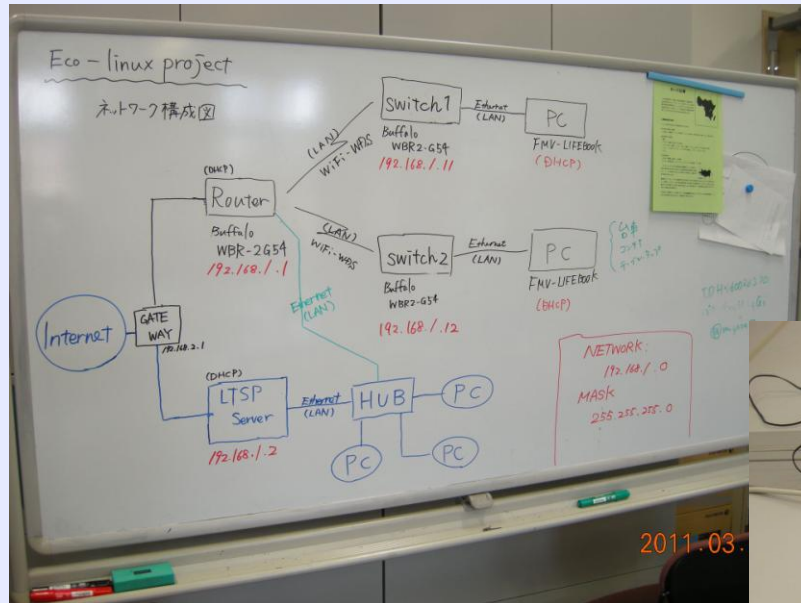
# Testing the WiFi-WDS connections in the car



# Ecolinux and thin-client system

- ◆ As a matter of fact, we have seen many illegal Microsoft “Windows” software used on PCs in Ouagadougou.
- ◆ To avoid this legitimacy issues, we have developed and used some open softwares, Ecolinux, skype and Open-Office.
- ◆ With the guidance of Lecturer Yoshino, Mr Nishio and Ms. Miyawaki have developed Ecolinux in Japan, compiled from one of the most popularized Linux, “ubuntu”, and saved in CD-ROM.
- ◆ Mr. Nishio has also developed a tiny thin-client system connected to the ubuntu main server via WiFi or ethernet.
- ◆ We carried 2 old PCs and Ecolinux CD-ROMs to BF, but the university campus was still closed to the local students so that we decided to scale down this Ecolinux and thin-client server system demonstration.
- ◆ We demonstrated Ecolinux and thin-client system in front of Mr Mawatari, local member of JOVC, the agents of a small local company of wireless activities and our local driver, Mr. Ab-san.
- ◆ It would be much more fruitful if JICA/JOVC staff joined us but they were ordered staying in the hotel because of the military riot.

# Networked thin-client server system



These photos were taken in KSC not in Ouagadougou.

# Development of Ecolinux in KSC



These photos were taken in KSC not in Ouagadougou.

## Ecolinux and thin-client server system testing in Ouagadougou



# Show the ubuntu server to the agents of local company



# Show thin-client server systems to Mr. Ab-san



# Skype video chat on the thin-client PC (video)



Photos taken by Mr. Nishio

# references

- ◆ Claude Lévi-Strauss, *La Pensée Sauvage*, Librairie Plon, Paris, 1962 (邦訳: 大橋保夫訳, 野生の思考, p.22, みすず書房, 1976年)
- ◆ Everett M. Rogers, *Diffusion of Innovations*, Freepress, 1962 (邦訳: 藤竹暁, 培風館, 1966年)
- ◆ Fritz Machlup, "The Production and Distribution of Knowledge in the United States", Princeton, New Jersey, Princeton University Press, 1972.
- ◆ Paul Romer, *Endogenous Technology Change*, p.187-218, *Landmark papers in economic growth*, selected by Robert M. Solow. -- Edward Elgar Pub., 2001
- ◆ 根津利三郎、第5章情報インフラ、p.113-158、柴田勉／竹内弘高共編、田村勝省訳、より高度の知識経済化で一層の発展をめざす日本—諸外国への教訓、世界銀行、2007
- ◆ 米澤彰純／小杉礼子、第7章教育・訓練・人的資源: 技能の要請に応える、p.202-203、柴田勉／竹内弘高共編、田村勝省訳、より高度の知識経済化で一層の発展をめざす日本—諸外国への教訓、世界銀行、2007
- ◆ NAKANO Yukinori, *Comparison of several types of knowledge industries between Japan and Europe*, International Input-Output Association, The 16th IIOA Conference, Istanbul, 2007
- ◆ NAKANO Yukinori, *L'analyse structurelle de l'industrie de la connaissance: une comparaison entre la France et le Japon.*, JFR' 09, Journée Francophone de la Recherche, Sciencescope, Maison Franco-Japonaise, 2009

## Useful information to know Burkina Faso

- ◆ INSD, Enquête burkinabé sur les conditions de vie des ménages 2003 et enquête annuelle sur les conditions de vie des ménages (EA – QUIBB), 生活実態統計, 2005 et 2007
- ◆ Bharti Airtel社がブルキナのCeltelを買収、2010年6月8日、
- ◆ <http://www.africaburkina.com/spip.php?article410#spip-listes>
- ◆ Société nationale d'électricité du Burkina (SONABEL)、電力統計
- ◆ 西アフリカ電波利用促進国際協力研究センター (CRIOR)、<http://www.ksc.kwansei.ac.jp/~crior/>

## Author's address and phone number

- ◆ NAKANO Yukinori
- ◆ Professor, School of Policy Studies,  
Kwansei Gakuin University
- ◆ 2-1, Gakuen, Sanda-shi, Hyogo-ken,  
669-1337 JAPAN
- ◆ Phone: +81. 79. 565.7601
- ◆ Telefax: +81. 79. 565.7605
- ◆ E-mail: [z97033@kwansei.ac.jp](mailto:z97033@kwansei.ac.jp)