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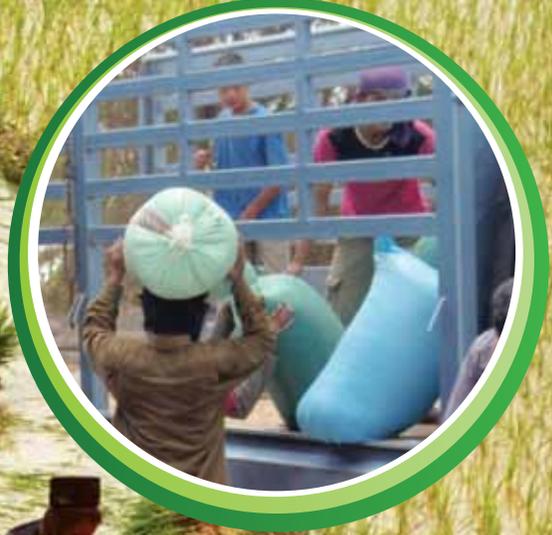
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POLICY BRIEF



REPORT NO. 62276-LA

Lao People's Democratic Republic Responding to Rice Price Inflation

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ມາດຕະການ ຕໍ່ກັບ ການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າ



ນະໂຍບາຍ ໂດຍສັງເຂບ

Lao People's Democratic Republic Responding to Rice Price Inflation Policy Brief

August 15, 2011

Social, Environmental, and Rural Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region



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CURRENCY EQUIVALENTS

(Exchange rate effective June 13, 2011)

Currency Unit = Lao Kip (LAK)

US\$ 1.00 = LAK 8,029

GOVERNMENT FISCAL YEAR

October 1 – September 30

WEIGHTS AND MEASURES

Metric System

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ບົດສັງລວມ

ຈຸດປະສົງຂອງເອກະສານຫຍໍ້ຂອງນະໂຍບາຍນີ້ແມ່ນເພື່ອກຳນົດທາງບັນດາປັດໃຈທີ່ເປັນໄດ້ທີ່ເປັນສາເຫດທີ່ພາໃຫ້ລາຄາເຂົ້າໃນບໍ່ດົນຜ່ານມາສູງຂຶ້ນ ແລະ ສະເໜີທາງເລືອກຕ່າງໆ ເພື່ອຄຸ້ມຄອງລາຄາເຂົ້າບໍ່ໃຫ້ປ່ຽນແປງຢ່າງໄວວາໃນອະນາຄົດ. ໃນໄລຍະກາງປີ 2010 ລາຄາເຂົ້າໜຽວ ຢູ່ລາວໄດ້ເພີ່ມຂຶ້ນເກີນກວ່າ 50%. ໃນຄວາມເປັນຈິງ, ລາຄາເຂົ້າໃນປີ 2010 ທີ່ສູງຂຶ້ນນັ້ນແມ່ນເກີນກວ່າໄລຍະປີ 2006 ຫາ 2008 ຊຶ່ງແມ່ນໄລຍະທີ່ເກີດວິກິດການອາຫານໃນໂລກ. ເຖິງແມ່ນວ່າລາຄາເຂົ້າໃນຢູ່ໃນສະພາບສະຫງົບໃນໄລຍະເຄິ່ງປີທຳອິດຂອງປີ 2011 ກໍ່ຕາມແຕ່ວ່າກໍ່ຍັງເປັນລາຄາທີ່ສູງຢູ່ເມື່ອທຽບໃສ່ ປະຫວັດສາດທີ່ຜ່ານມາ. ເອກະສານນະໂຍບາຍສະບັບນີ້ມີຈຸດປະສົງຊອກຫາບັນດາປັດໃຈທີ່ພາໃຫ້ລາຄາເຂົ້າສູງຂຶ້ນ ແລະ ໃຫ້ຄຳສະເໜີແນະທາງດ້ານນະໂຍບາຍໃນເບື້ອງຕົ້ນ.

ເຂົ້າມີຄວາມສຳຄັນຫຼາຍທີ່ສຸດ ສຳລັບສປປ ລາວ. ໃນຖານະທີ່ເປັນອາຫານຫຼັກ, ເຂົ້າໜຽວຍັງມີຄວາມສຳຄັນທາງດ້ານວັດທະນາທຳ ແລະ ການເມືອງອີກດ້ວຍ. ເປັນທີ່ຄາດຄະເນວ່າຄົນລາວຜູ້ໜຶ່ງບໍລິໂພກເຂົ້າສານ 200 ກິໂລກຣາມຕໍ່ຄົນ ໃນແຕ່ລະປີ ຊຶ່ງກວມເອົາ 70% ຂອງອາຫານທີ່ເປັນທາດກາລໍຣີ ແລະ ໂປຣຕີນ¹.

ການຜະລິດເຂົ້າຢູ່ໃນລາວເປັນແບບພໍກຸ້ມກິນ. ມີພຽງປະມານ 10% ຂອງການຜະລິດເຂົ້າເທົ່ານັ້ນທີ່ໄດ້ເອົາໄປຂາຍໃນຕະຫຼາດ. ການປູກເຂົ້າກວມເອົາຫຼາຍກວ່າ 80% ຂອງເນື້ອທີ່ປູກຝັງທັງໝົດ. ໃນດ້ານພູມສາດເຫັນວ່າເຂົ້າປູກໄດ້ຢູ່ທຸກພາກພື້ນຂອງປະເທດ ແຕ່ວ່າສ່ວນຫຼາຍຈະຢູ່ໃນເຂດທີ່ງ່າຕາມທົ່ງພຽງຊຶ່ງເປັນເຂດທີ່ຢູ່ໃກ້ຊາຍແດນຕິດກັບປະເທດໄທ. ການປູກເຂົ້າສ່ວນຫຼາຍຈະແມ່ນເຂົ້າໜຽວຢູ່ໃນ 3 ເຂດຫລັກຂອງລະບົບນິເວດ: ເຂດທົ່ງພຽງທີ່ເຮັດນາດ້ວຍນໍ້າຝົນ, ເຂດປູກເຂົ້າໄຮ່, ແລະ ເຂດນາດ້ວຍນໍ້າຊົນລະປະທານ.

ການບັນລຸການຜະລິດເຂົ້າໃຫ້ກຸ້ມກິນໃນລະດັບທົ່ວປະເທດໄດ້ກາຍເປັນບຸລິມະສິດທີ່ສຳຄັນອັນໜຶ່ງສຳລັບລັດຖະບານ. ເຖິງແມ່ນວ່າໄດ້ມີການປັບປຸງໃນການຜະລິດ ແລະ ການເກັບກ່ຽວຜົນລະປູກເຂົ້າ ກໍ່ບໍ່ໄດ້ໝາຍເຖິງວ່າທຸກຄອບຄົວຢູ່ໃນຊົນນະບົດຈະມີເຂົ້າກຸ້ມກິນຕາມຄວາມຕ້ອງການພໍລິໂພກຂອງຕົນ. ເນື່ອງຈາກວ່າເຂົ້າທີ່ເອົາໄປຂາຍໃນຕະຫຼາດມີຈຳນວນໜ້ອຍ ສປປ ລາວ ຈຶ່ງມີຄວາມອ່ອນໄຫວຕໍ່ການເໜັງຕີງຂອງລາຄາເຂົ້າທີ່ເກີດມາຈາກການຂາດແຄນການສະໜອງເຂົ້າຢູ່ພາຍໃນປະເທດ ແລະ ການພັດທະນາການຄ້າໃນພາກພື້ນ.

ການສະໜອງເຂົ້າຢູ່ພາຍໃນປະເທດ ແລະ ບັນດາປັດໃຈຄວາມຕ້ອງການສາມາດອະທິບາຍໄດ້ພຽງແຕ່ສ່ວນໜ້ອຍໜຶ່ງເທົ່ານັ້ນຂອງການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າໜຽວໃນປີ

¹ ເຂົ້າໜຽວຍັງຖືກໃຊ້ເຮັດເປັນເສັ້ນເຜີ ແລະ ອາຫານປະເພດຂອງຫວານຢ່າງຫລວງຫລາຍອີກດ້ວຍ.

2010. ພວກເຮົາໄດ້ພົບເຫັນວ່າການສະໜອງເຂົ້າທີ່ບໍ່ພຽງພໍຢູ່ພາຍໃນປະເທດອາດອະທິບາຍໄດ້ສ່ວນໜ້ອຍໜຶ່ງເທົ່ານັ້ນຂອງການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າຊຶ່ງຍັງບໍ່ທັນມີຄວາມແນ່ນອນບາງດ້ານກ່ຽວກັບຂໍ້ມູນທາງດ້ານບໍລິມາດການຜະລິດເຂົ້າ ແລະ ເຂດຜະລິດເຂົ້າ ພວກເຮົາໃນພົບເຫັນວ່າທ່າອ່ຽງຂອງລະດູການ ແລະ ການຫລຸດລົງຂອງເຂົ້າທີ່ເອົາໄປຂາຍໃນຕະຫຼາດໃນປີ 2010 ຂອງເຂົ້ານາປີທີ່ຫລຸດລົງຍ້ອນສະພາບໄພແຫ້ງແລ້ງນັ້ນກໍຍັງບໍ່ສາມາດໃຫ້ເຫດຜົນຢ່າງພຽງພໍຕໍ່ການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າ. ການວິເຄາະຍັງຊີ້ໃຫ້ເຫັນວ່າມີການສະໜອງເຂົ້າແບບໃຫ້ສິນເຊື່ອ ແລະ ມີການກະຕຸ້ນເຂົ້າຂອງບັນດາໂຮງສີ.

ການຄ້າເຂົ້າໃນພາກພື້ນອາດເປັນສາເຫດຕົ້ນຕໍຂອງການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າໜຽວ. ການວິເຄາະໄດ້ຊີ້ໃຫ້ເຫັນວ່າການຄ້າໃນພາກພື້ນພາໃຫ້ລາຄາເຂົ້າເພີ່ມຂຶ້ນຊຶ່ງພາໃຫ້ລາຄາເຂົ້າຢູ່ພາຍໃນປະເທດມີການປັບປ່ວນ ແລະ ການຕອບໂຕ້ທາງດ້ານນະໂຍບາຍທາງການຄ້າທີ່ບໍ່ທັນກັບສະພາບການ. ການຄ້າເຂົ້າກັບປະເທດຫວຽດນາມອາດແມ່ນເຫດຜົນຕົ້ນຕໍສໍາລັບການເພີ່ມສູງຂຶ້ນຂອງລາຄາເຂົ້າໃນໄລຍະສັ້ນ ໃນຄະນະທີ່ການຄ້າເຂົ້າກັບປະເທດໄທໄດ້ມີຜົນກະທົບໃນໄລຍະກາງ ແລະ ໄລຍະຍາວ. ບັນດາຜູ້ສົ່ງອອກເຂົ້າລາຍໃຫຍ່ທີ່ເປັນທາງການທີ່ສົ່ງເຂົ້າໄປຂາຍໃນຫວຽດນາມພາໃຫ້ລາຄາເຂົ້າສູງຂຶ້ນໃນປີ 2006 ແລະ 2010. ການວິເຄາະໄດ້ສະແດງໃຫ້ເຫັນວ່າການເພີ່ມຂຶ້ນຂອງລາຄາເຂົ້າ

ແມ່ນສູງທີ່ສຸດຢູ່ໃນເຂດທີ່ມີການຄ້າເຂົ້າກັບຫວຽດນາມ ແລະ ໄທ. ຢ່າງໃດກໍຕາມການຄິດໄລ່ສົມທຽມໃສ່ລາຄາເຂົ້າໜຽວໃນຕະຫຼາດພາຍໃນປະເທດແມ່ນບໍ່ຄືກັນເນື່ອງຈາກວ່າລາຄາເຂົ້າໄດ້ເພີ່ມຂຶ້ນຈາກບັນດາປະເທດເພື່ອນບ້ານໄດ້ມີຜົນກະທົບຢ່າງໄວວາຫຼາຍກວ່າການຫລຸດລົງຂອງລາຄາເຂົ້າ. ຂໍ້ມູນທີ່ພົບເຫັນສະເພາະຈາກການຄົ້ນຄວ້ານະໂຍບາຍນີ້ປະກອບມີ:

- *ເຂົ້າລາວເປັນທີ່ຕ້ອງການຢູ່ປະເທດຫວຽດນາມ:* ທັງນີ້ກໍເພາະວ່າພື້ນທີ່ການຜະລິດທີ່ອໍານວຍຕໍ່ການເກັບກ່ຽວ, ແລະ ມີຄວາມຕ້ອງການເຂົ້າໜຽວຢ່າງຫຼວງຫຼາຍສໍາລັບໂອກາດພິເສດສໍາຄັນຕ່າງ ໆ. ໃນຄວາມເປັນຈິງທີ່ວ່າໄລຍະທີ່ລາຄາເຂົ້າສູງຂຶ້ນແມ່ນກົງກັບໄລຍະທີ່ມີການສົ່ງເຂົ້າອອກຢ່າງຫຼວງຫຼາຍໄປຫວຽດນາມທີ່ຖືກຕ້ອງເປັນທາງການເຊິ່ງມັນພົວພັນກັບການຕັດສິນບັນຫາທາງດ້ານນະໂຍບາຍກາຍຄ້າໃນລະດັບປະເທດ ແລະ ລະດັບແຂວງຊຶ່ງມີຜົນຕໍ່ການປະຕິບັດລາຄາເຂົ້າທີ່ມີການປ່ຽນແປງຢູ່ເລື້ອຍ ໆ
- *ການຄ້າເຂົ້າກັບປະເທດໄທກໍມີຄວາມສໍາຄັນເນື່ອງຈາກຄວາມຕ້ອງການທີ່ຄ້າຍຄືກັນສໍາລັບ ເຂົ້າໜຽວທີ່ເປັນອາຫານຫລັກ ເຖິງແມ່ນວ່າຂໍ້ມູນກ່ຽວກັບການຂາຍເຂົ້າໄປໄທໃນຕົວຈິງຍັງເປັນທີ່ບໍ່*

ສາມາດເຊື່ອຖືໄດ້ກໍ່ຕາມ. ລາຄາເຂົ້າ
ເປືອກຂອງລາວຍັງຖືກກວ່າລາຄາເຂົ້າ
ເປືອກຂອງໄທໃນເວລາຂາຍອອກຈາກທົງ
ນາໃນຂະນະທີ່ລາຄາເຂົ້າສານໜຽວຂອງ
ລາວແພງກວ່າຂອງໄທອັນເນື່ອງມາຈາກ
ຄຳສື່ເຂົ້າແພງກວ່າ. ດັ່ງນັ້ນຈິງມີຄວາມ
ຈູງໃຈໃນການສົ່ງອອກເຂົ້າເປືອກ.

ການວິເຄາະລະອຽດກ່ຽວກັບລາຄາ
ເຂົ້າຢູ່ໃນລາວຍັງຖືກຈຳກັດຍ້ອນການຂາດ
ຂໍ້ມູນຂອງການຄ້າເຂົ້າຢູ່ໃນລະດັບພາກພື້ນ.
ມີຄວາມເປັນໄປໄດ້ທີ່ວ່າການຂາດເຂົ້າ
ສະໜອງຕະຫຼາດອາດຈະເປັນບັນຫາທີ່
ກ່ຽວຂ້ອງກັບລະດັບພາກພື້ນຊຶ່ງມີຜົນກະທົບຕໍ່
ລາວ, ໄທ ແລະ ຫວຽດນາມໄປພ້ອມ ໆ
ກັນ. ດັ່ງການການວິເຄາະໃນອະນາຄົດຄວນ
ເບິ່ງທ່າອ່ຽງການຜະລິດເຂົ້າໜຽວໃນລະດັບ
ພາກພື້ນ ແລະ ການຄ້າຂາຍເຂົ້າໜຽວເພື່ອ
ເຮັດການປະເມີນຂອບເຂດຂອງຜົນກະທົບທີ່
ສາມາດອະທິບາຍເຫດຜົນຕໍ່ການປ່ຽນແປງ
ຂອງລາຄາເຂົ້າຢ່າງໄວວາຢູ່ໃນລາວ. ທັງນີ້ກະ
ເພາະວ່າການຄ້າເຂົ້າອາດເປັນຕົ້ນເຫດອັນໜຶ່ງ
ຂອງການພຸ່ງຂຶ້ນຂອງລາຄາເຂົ້າຂອງລາວດັ່ງ
ທີ່ໄດ້ສະແດງໃຫ້ເຫັນຢູ່ໃນຂໍ້ມູນທີ່ເກັບກຳໄດ້ຢູ່
ໃນເອກະສານສະບັບນີ້ແຕ່ວ່າການປ່ຽນແປງ
ລາຄາເຂົ້າຢ່າງໄວວາໃນປະເທດໄທ ແລະ
ປະເທດຫວຽດນາມ ແລະ ປັດໃຈອື່ນ ໆທີ່
ເປັນສາເຫດຂອງການປ່ຽນແປງລາຄາເຂົ້າໃນ

ບັນດາປະເທດເພື່ອນບ້ານອາດເປັນສາເຫດ
ເບື້ອງຕົ້ນກໍ່ໄດ້.

ການຕອບໂຕ້ທາງດ້ານນະໂຍບາຍ
ຂອງລັດຖະບານໃນປະຈຸບັນຕໍ່ລາຄາເຂົ້າ
ປະກອບດ້ວຍ (i) ການຈຳກັດການສົ່ງອອກ,
(ii) ການກັກເຂົ້າໄວ້ຢູ່ໃນສາງ, ແລະ (iii)
ແຜນການຕ່າງ ໆ ເພື່ອຄວບຄຸມລາຄາເຂົ້າ
ໄລຍະຊົ່ວຄາວ. ແຕ່ຢ່າງໃດກໍ່ຕາມປະສິດທິ
ຜົນຂອງບັນດາມາດຕະການທາງດ້ານນະ
ໂຍບາຍນີ້ຍັງມີຫຼັກສະນະປົນເປກັນຢູ່.
ກ່ອນອື່ນໝົດລາຄາສົ່ງອອກເຂົ້າຂອງລາວ
ໄດ້ຖືກຈຳກັດໂດຍ ໂກຕ້າ ການສົ່ງອອກ
ແລະ ອາກອນ. ອາດມີຄວາມຂັດແຍ່ງກັນ
ລະຫວ່າງນະໂຍບາຍການຄ້າແຫ່ງຊາດ ແລະ
ສິດທິຂອງບັນດາແຂວງທີ່ຈະອອກອະນຸຍາດ
ໂກຕ່າສຳລັບການສົ່ງອອກ. ປະເດັນທີ່ ສອງ
ກໍ່ຄືວ່າການເຂົ້າແຊກແຊງຂອງລັດຖະບານ
ເພື່ອຮັກສາລາຄາເຂົ້າດ້ວຍການເກັບຊື້ເຂົ້າໄວ້
ຢູ່ໃນສາງອາດຈະເປັນວິທີການທີ່ບໍ່ຄັກແນ່ປານ
ໃດທ່າຈະເບິ່ງຜົນປະໂຫຍດທີ່ມີຫຼັກສະນະ
ຈຳກັດສຳລັບບັນດາໂຮງສີ. ປະເດັນທີ່ ສາມ
ກໍ່ຄືວ່າການຄວບຄຸມລາຄາອາດເປັນຜົນ
ກະທົບບໍ່ດີໄລຍະຍາວຕໍ່ການຜະລິດເຂົ້າ.
ປະສົບການສາກົນໄດ້ສະແດງໃຫ້ເຫັນວ່າການ
ເຂົ້າແຊກແຊງໃນຫຼັກສະນະດັ່ງກ່າວນັ້ນມັກ
ຈະເກີດຄວາມຫຼົ້ມເຫຼວໃນການບັນລຸບັນດາ
ເປົ້າໝາຍທີ່ວາງໄວ້. ໃນຄວາມເປັນຈິງ ຍັງມີ
ຄວາມສ່ຽງທີ່ວ່າການແຊກແຊງໃນຫຼັກສະນະ
ດັ່ງກ່າວອາດພາໃຫ້ເກີດຄວາມບໍ່ແນ່ນອນຫຼາຍ
ຂຶ້ນຕໍ່ຜູ້ຜະລິດ ແລະ ຜູ້ຄ້າຂາຍຊຶ່ງສ້າງຄວາມ

ຈຳກັດຕໍ່ການລົງທຶນ, ການຜະລິດ ແລະ ຄວາມຈູງໃຈໃນການຄ້າ.
 ມັນມີຄວາມຈຳເປັນທີ່ຈະຕ້ອງໄດ້ມີການ
 ປະສານງານຢ່າງໃກ້ຊິດລະຫວ່າງການຜະລິດ
 ເຂົ້າ ແລະ ນະໂຍບາຍທາງການຄ້າຢູ່ໃນ
 ລະດັບປະເທດ ແລະ ລະດັບແຂວງເພື່ອຄຸ້ມ
 ຄອງບໍ່ໃຫ້ປ່ຽນແປງລາຄາຢ່າງໄວວາຢ່າງມີ
 ປະສິດທິຜົນ. ສິ່ງນີ້ອາດຮຽກຮ້ອງໃຫ້ມີ
 ຄວາມຮູ້ດີ ແລະ ມີລະບົບຂໍ້ມູນຂ່າວສານເພື່ອ
 ເປັນພື້ນຖານໃຫ້ແກ່ການຕັດສິນທາງດ້ານນະ
 ໂຍບາຍ. ວິທີການປະຕິບັດທີ່ສະເໜີໃຫ້ອາດ
 ປະກອບດ້ວຍ:

- ພັດທະນາຍຸດທະສາດສຳລັບຂະແໜງ
 ການເຂົ້າ ແລະ ກອບວຽກນະໂຍບາຍ.
 ສິ່ງນີ້ຈະເປັນພື້ນຖານສຳລັບການປະສານ
 ງານ ແລະ ການວາງແຜນສຳລັບການ
 ລົງທຶນຂອງພາກສ່ວນລັດ ແລະ ເອກະ
 ຊົນເພື່ອສົ່ງເສີມການຜະລິດເຂົ້າ. ການ
 ເພີ່ມການຜະລິດ ແລະ ມີເຂົ້າເຫລືອກິນ
 ອອກຂາຍຢູ່ຕະຫຼາດແມ່ນເງື່ອນໄຂທີ່ຈຳ
 ເປັນສຳລັບສະຖຽນລະພາບຂອງລາຄາ
 ເຂົ້າໃນອະນາຄົດ² ໂດຍການເພີ່ມຂຶ້ນ
 ຂອງພື້ນລະເມືອງລາວດ້ວຍອັດຕາ 2,2%
 ຕໍ່ປີ ຄວາມຕ້ອງການເຂົ້າຄາດຄະເນວ່າ
 ຈະເພີ່ມຂຶ້ນໄປຄຽງຄູ່ກັນຕາມການເວລາ

² ການຄາດຄະເນຂອງລັດຖະບານແມ່ນເຮັດໃຫ້ການ
 ຜະລິດເຂົ້າຄວນເພີ່ມຂຶ້ນຈາກ 3 ລ້ານໂຕ້ນໃນປະຈຸບັນ
 ເປັນ 4,2 ລ້ານໂຕ້ນພາຍໃນປີ 2015.

ຊຶ່ງມີຄວາມຕ້ອງການໃຫ້ເພີ່ມການຜະລິດ
 ແລະ ການເກັບກຽວໃຫ້ສູງຂຶ້ນ. ລະດັບ
 ຂອງລາຄາເຂົ້າທີ່ສູງໃນປະຈຸບັນເປັນທີ່
 ຄາດວ່າຍັງຈະຄົງຢູ່ຕະຫຼອດໄປແມ່ນ
 ໂອກາດອັນໜຶ່ງສຳລັບການພັດທະນາ
 ຂອງຂະແໜງການເຂົ້າໃນລາວ. ການ
 ພັດທະນາຍຸດທະສາດອັນຄົບຖ້ວນ ແລະ
 ກອບວຽກທາງດ້ານນະໂຍບາຍຈະຊ່ວຍ
 ປະສານງານໃຫ້ແກ່ການຜະລິດ, ການສີ
 ເຂົ້າ ແລະ ການຕັດສິນບັນຫາທາງດ້ານ
 ນະໂຍບາຍການຄ້າເຂົ້າ. ຄວາມສຳຄັນ
 ອີກດ້ານໜຶ່ງກໍ່ຄືຈະຕ້ອງໄດ້ເຮັດການ
 ປະສານງານກ່ຽວກັບການຕັດສິນບັນ
 ຫາດ້ານນະໂຍບາຍຢູ່ລະດັບສູນກາງ,
 ແຂວງ ແລະ ເມືອງ ແລະ ແກ້ໄຂບັນຫາ
 ການຂາດຂໍ້ມູນ.

- ສ້າງຕັ້ງໃຫ້ມີລະບົບການຕິດຕາມລາຄາ
 ເຂົ້າຢ່າງມີປະສິດທິຜົນ. ລະບົບດັ່ງກ່າວ
 ນີ້ຄວນຕິດຕາມລາຄາເຂົ້າພາຍໃນປະເທດ
 ແລະ ລະດັບພາກພື້ນໄປພ້ອມກັນ,
 ຕິດຕາມທ່າອຽງການຜະລິດ ແລະ ການ
 ຄ້າ. ຍັງຂາດຂໍ້ມູນກ່ຽວກັບບໍລິມາດການ
 ຜະລິດເຂົ້າພາຍໃນປະເທດ, ການເກັບ
 ມ້ຽນເຂົ້າ, ການຄ້າເຂົ້າທີ່ເປັນທາງການ
 ແລະ ບໍ່ເປັນທາງການ ແລະ ລາຄາເຂົ້າ.
 ຍິ່ງໄປກວ່ານັ້ນການຕັດສິນນະໂຍບາຍ
 ກ່າວກັບລາຄາເຂົ້າໃນລະດັບປະເທດແມ່ນ

ຂຶ້ນກັບສະພາບ ແລະ ການເພິ່ງຕິງຂອງ ຕະຫຼາດລາຄາເຂົ້າໜຽວໃນລະດັບພາກ ພື້ນ. ດັ່ງນັ້ນຂໍ້ມູນກ່ຽວກັບການຄ້າຂາຍ ເຂົ້າຂ້າມຊາຍແດນລະຫວ່າງບັນດາປະ ເທດໃນພາກພື້ນ ແລະ ຄຸນລັກສະນະ ຂອງລາຄາເຂົ້າໜຽວໃນຕະຫຼາດຈຶ່ງເປັນ ບາດກ້າວທຳອິດທີ່ສຳຄັນໃນນະໂຍບາຍ ພາຍໃນປະເທດ ແລະ ສຳລັບການວາງ ແຜນການລົງທຶນ.

- ບໍ່ໃຊ້ມາດຕະການໄລຍະສັ້ນເຂົ້າໃນການ ເຂົ້າແຊກແຊງແກ້ໄຂບັນຫາລາຄາເຂົ້າໃນ ຕະຫຼາດ. ເຫດຜົນຕົ້ນຕໍກໍຄືວ່າບັນດາຄົວ ເຮືອນຕ່າງໆ ຢູ່ໃນລາວໄດ້ຮັບຜົນປະ ໂຫຍດແບບສະເລ່ຍກັນໄປຈາກລາຄາເຂົ້າ ທີ່ສູງຂຶ້ນ ເຖິງແມ່ນວ່າມີບາງກຸ່ມ ປະຊາກອນຈຳນວນໜຶ່ງໃນເຂດຕົວເມືອງ ແລະ ເຂດຂາດແຄນເຂົ້າຈະບໍ່ໄດ້ຮັບຜົນ ປະໂຫຍດກໍຕາມ. ສຳລັບປະຊາຊົນຜູ້ທີ່ ໄດ້ຮັບຜົນກະທົບໃນທາງບໍ່ດີທີ່ເກີດມາ ຈາກລາຄາເຂົ້າທີ່ສູງຂຶ້ນລັດຖະບານອາດ ພິຈາລະນາຂະຫຍາຍແຜນງານ ຕາໜ່າງຄວາມປອດໄພທາງສັງຄົມ, ເປັນ ຕົ້ນແມ່ນແຜນງານອາຫານເພື່ອງານ, ຊຶ່ງ ເປັນການເຂົ້າແຊກແຊງແກ້ໄຂບັນຫາທີ່ມີ ປະສິດທິຜົນອັນໜຶ່ງ.
- ບຸກຈິດສຳນຶກໃຫ້ຮູ້ຜົນເນື່ອງຕໍ່ລະບົບ ເສດຖະກິດມະຫາພາກໃນໄລຍະຍາວ.

ຍັງມີຄວາມຈຳເປັນທີ່ຈະຕ້ອງເພີ່ມຄວາມ ເຂົ້າໃຈກ່ຽວກັບວ່າລາຄາຂອງອາຫານ ແລະ ພະລັງງານໃນໂລກມີຜົນກະທົບຕໍ່ ລາຄາສິນຄ້າຢູ່ໃນລາວ ແລະ ຢູ່ໃນພາກ ພື້ນຄືແນວໃດ. ລາຄາສິນຄ້າບໍລິໂພກທີ່ ມີການປ່ຽນແປງໃນປະເທດໄທ ແລະ ຫວຽດນາມອາດສົ່ງຜົນກະທົບທີ່ສຳຄັນຕໍ່ ລາຄາສິນຄ້າຢູ່ໃນລາວ. ບັນດາ ມາດຕະການທາງດ້ານນະໂຍບາຍຄວນ ຄຳນຶງວ່າການເພີ່ມຂຶ້ນຂອງລາຄາອາຫານ ແລະ ເຂົ້າມີຜົນກະທົບຕໍ່ເນື່ອງໂດຍກົງໃສ່ ຄ່າແຮງງານຢູ່ພາຍໃນປະເທດ. ການ ຄາດຄະເນຕ່າງໆ ລ່ວງໜ້າກໍອາດເກີດ ຄວາມກົດດັນໃຫ້ລາຄາເພີ່ມຂຶ້ນໄປຕາມ ການເວລາໃນອະນາຄົດເຊັ່ນກັນ. ຍິ່ງໄປ ກວ່ານັ້ນລາຄາເຂົ້າທີ່ສູງໃນປະຈຸບັນໄດ້ ເກີດຂຶ້ນຍ້ອນການເພີ່ມຂຶ້ນຂອງການປ່ອຍ ສິນເຊື້ອຂອງພາກສ່ວນເອກະຊົນຊຶ່ງຢູ່ໃນ ຕົວຂອງມັນກໍພາໃຫ້ມີຄວາມກົດດັນທີ່ຈະ ພາໃຫ້ລາຄາສູງຂຶ້ນ. ສິ່ງທັງໝົດເຫຼົ່ານີ້ ສະແດງໃຫ້ເຫັນວ່າມີຄວາມຈຳເປັນທີ່ຈະ ຕ້ອງມີການຕິດຕາມຢ່າງຄົບຖ້ວນກ່ຽວກັບ ທ່າອຽງຂອງລາຄາເຂົ້າຢູ່ໃນລາວ.

EXECUTIVE SUMMARY

The objective of this policy brief is to identify likely factors driving the recent rice price hike and suggest options to manage rice price volatility in the future. In mid-2010, glutinous rice prices in Laos increased by more than 50 percent. In fact, the 2010 price hike was faster than during the 2006 to 2008 global food crisis. Although rice prices have subdued in first half of 2011, they remain historically high. This policy note aims to identify factors behind the recent rice price hikes and make initial policy recommendations.

Rice is of utmost importance for Laos. As the main staple food, glutinous rice has also major cultural and political significance. It is estimated that people in Laos consume up to 200 kilograms per capita of milled rice per annum, constituting some 70 percent of their calorie and protein intake.³

Rice production in Laos is subsistence oriented. Only some 10 percent of production capacity is actually marketed. Cultivation covers more than 80 percent of the total cropped area. Geographically, rice is grown in all regions of the country, but the overwhelming part of rice production is from lowland fields, which are in close proximity to the Thai border. Most production is glutinous rice, distributed along three main ecosystems: low-land rain-fed rice, upland rice, and irrigated dry season rice.

Achieving self-sufficiency in rice at the national level has been a top priority for the Government. In spite of the improvements in rice production and

yields, not all rural households are able to fully meet their rice consumption requirements. Because of its small market surpluses, Laos is vulnerable to price fluctuations stemming from domestic supply shocks and regional trade developments.

Traditional supply and demand factors explain only a small part of the 2010 glutinous rice price inflation. We find that domestic rice supply shortfalls might explain only a small part of recent rice price inflation, albeit there is some uncertainty about the information about aggregate production volumes and its location. We show that both seasonality trends and decline in marketable surpluses in 2010 wet season due to dry spell do not explain sufficiently well the rice price inflation. The analysis also rules out increased credit supply and hoarding by millers.

Regional trade is likely the main proximate cause for high glutinous rice prices. The analysis shows that regional trade triggers price increases, which in turn may have been exaggerated by domestic price and trade policy responses.

Trade with Viet Nam was likely the main reason for short term price fluctuations, while trade with Thailand affects medium and long term price trends. Large official rice exports to Vietnam preceded the price jumps both in 2006 and 2010. The analysis shows that rice inflation has been highest in areas that trade with Vietnam and Thailand. However, price transmission into the Lao glutinous rice market has been asymmetric, as rice price increases from neighboring countries are transmitted more rapidly than price decreases. Specific findings of this policy brief include:

³ In addition, the use of glutinous rice for various rice-flour noodles and sweets is extensive.

- *There is a natural demand for Lao rice in Vietnam.* This is because of favorable geography, harvest patterns, and a large demand for glutinous rice for special occasions. The fact that periods of large rice price hikes coincide with large official exports to Viet Nam is also attributed to national and provincial trade policy decisions, which appear to reinforce price volatility.
- *Trade with Thailand is important due to similar dietary preferences for glutinous rice as main staple food, although information about actual trade flows is unreliable.* Lao paddy is typically cheaper than Thai paddy at farm gate level, while the Lao milled glutinous rice is more expensive than the Thai equivalent due to high milling costs. Thus, there is thus a strong incentive to export paddy.

A detailed analysis of the effect of trade on rice prices in Laos, however, is limited by the paucity of information of regional supply dynamics. There is a possibility that major supply shocks may be *regional*, which could affect Laos, Thailand, and Vietnam simultaneously. Hence, future analysis should thus look at regional glutinous rice production trends and related trade flows, to estimate the extent they effectively can explain Lao price volatility. This is because trade may be the likely proximate cause of Lao price spikes, as indicated by the findings of this document, but volatility in Thai and Vietnamese production—and other factors explaining prices in neighboring countries—may be the original cause.

The current Government policy responses to high rice prices have included (i) export restrictions, (ii) stockpiling, and (iii) plans to implement

temporary price controls. However, the effectiveness of these policy measures has been mixed. First, Laos' rice exports are typically restricted by the use of export quotas and taxes. There may be a conflict between national trade policy and the rights of provinces to issue export quotas. Second, government intervention to stabilize rice prices in the form of stockpiling is partly unpopular, owing to likely limited benefits for millers. Third, price controls can induce negative consequences for long-run rice sector development. International experience suggests that such interventions often fail to their stated goals. In fact, there is a risk that they may cause more uncertainty for producers and processors which could limit investments, production and trade incentives.

There is a need to closely coordinate rice production and trade policies—at the national and provincial levels—in order to effectively manage price volatility. This would require good knowledge and information systems, which in turn would provide basis for evidence-based policy decisions. The proposed actions could include:

- *Develop a rice sector strategy and policy framework.* This would provide the basis for coordination and planning of public and private investments for enhanced rice production. Increasing production and marketable surplus is necessary condition for future price stability.⁴ With the Lao population growing at 2.2 percent per year, the demand for rice is expected to grow substantially

⁴ Government estimates suggest that rice production should increase from currently 3 million tons to 4.2 million tons by 2015.

over time, requiring continued yield and production increases. Current high rice price levels, which are expected to stay, are an opportunity for rice sector development in Laos. The development of a comprehensive strategy and policy framework will help to coordinate production, milling, and trade policy decisions. It will be also important to coordinate policy decisions at the national, provincial and district levels, and address knowledge gaps.

- *Establish an effective rice price monitoring system.* This should track simultaneously domestic and regional price, production and trade trends. There is paucity of information about the domestic production volumes, stocks in storage, formal and informal trade, and prices. Furthermore, effective national rice policy decisions in Laos depend also on dynamics and behavior of regional glutinous rice markets. Estimates of actual cross-border trade flows between countries and characteristics of the regional glutinous rice markets would be thus a useful first step in domestic policy and investment planning processes.
- *Restrain from intervening into rice markets through short-term measures.* The main reason for this is that households in Laos gain on average from higher rice prices, albeit, some of the population in urban and food deficit areas will lose. For those, who will be negatively affected by high rice prices, the Government may want to consider expanding social safety nets programs in Laos, such as food for work programs, as an effective intervention.

- *Be aware of long-run macroeconomic implications.* There is a need to better understand how world food and energy prices affect price trends in Laos and in the region. Consumer price developments in Thailand and Vietnam can have significant impact on prices in Laos through price transmission. Policy measures also need to consider that rice and food price increases eventually feed into domestic wages. And expectations can create inflationary pressures over time. Moreover, current price inflation is taking place in the context of already high private credit growth, which itself can contribute to inflationary pressures. All this justifies comprehensive monitoring of food price trends in Laos.

1. BACKGROUND AND OBJECTIVE

Rice is of special political and economic importance for Laos. It is the main staple crop and among the most important factors determining the welfare status of approximately 6.4 million people in Laos. Rice cultivation covers more than 80 percent of the total cropped area and it is grown in all regions of the country. The Central and Southern regions, in proximity to the Thai border, account for some 90 percent of the total rice production. During the last decade, Laos has experienced a steady increase in GDP and several improvements in the general standard of living. These achievements are attributed to multiple factors, including improved policies, which have resulted in high growth in services, hydro-energy, and mining, but in particular to agriculture and rice production.

During 2010, glutinous (sticky) rice prices increased by more than 50 percent. Glutinous price inflation, measured throughout this report as year-to-year growth rates, was in fact higher in 2010 than during the peak of the global food crisis in 2008. And even if prices have declined recently, glutinous rice inflation was still over 30 percent in February. Yet, despite its great importance, and concerns regarding price stability and social welfare impacts, there is little understanding of what drives the current price inflation. Anecdotal evidence suggests that it is not just a change in seasonality, and because of its magnitude, inflation cannot be explained entirely by traditional domestic supply and demand factors. The rice-price puzzle is made more complex by the fact that Laos produces mainly glutinous rice, largely for domestic consumption. Some observers believe that only a small international market exists for it. Hence,

despite the fact that high prices coincide with currently high world food prices, it is sometimes believed that international food price transmission only play a limited role.⁵

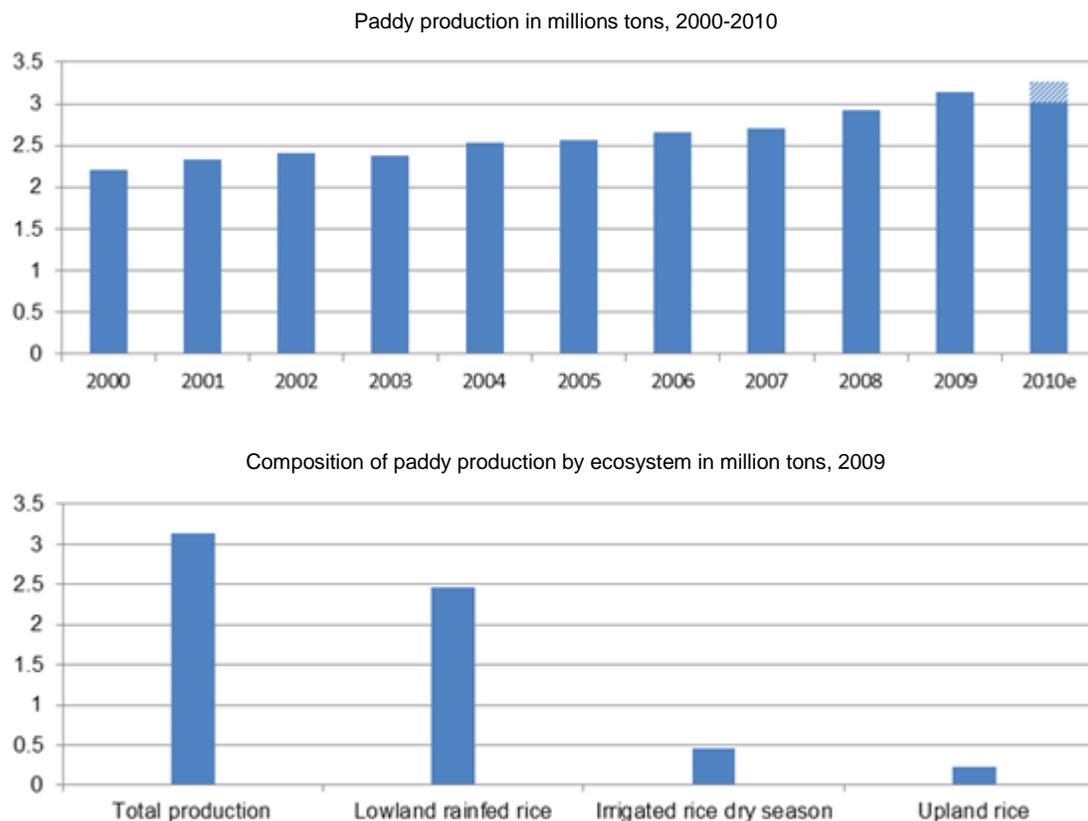
The objective of this policy note is to identify likely factors driving rice prices and suggest options to manage rice price volatility in the future. It also provides a snapshot of recent developments in the rice sector, and describes rice and food price trends and their implications. Based on these findings, the note discusses policy options. The policy brief has six chapters, including this introduction. Chapter 2 provides a brief outline of the rice sector. Chapter 3 describes recent trends in world and Lao food prices. It also provides insights into likely macroeconomic and household welfare impacts of rice price inflation. Chapter 4 discusses the potential causes of rice price inflation, as suggested by other reports and people interviewed. Chapter 5 analyzes the role of the regional rice market in determining prices, which this policy brief identifies as the primary cause of the glutinous rice price hike. Chapter 6 concludes by presenting recommendations.

2. THE RICE SECTOR IN LAOS

This chapter provides an overview of the Lao rice sector. The sector has grown significantly over the past decade. Most likely this was due to the successful introduction and adoption of improved seed varieties. Glutinous rice is the dominant variety of rice, accounting for about 85 percent of total rice output.

⁵ This policy brief, using rice price data over the past decade, will shed light on these assumptions.

Figure 1: Rice production increased and is dominated by lowland rain-fed paddy



Source: Lao Ministry of Agriculture and Forestry; and staff compilations.

These graphs show paddy production from 2000-2010 as well as the composition of production in 2009. Paddy production in 2010 is an estimate and shows a discrepancy between government forecasts and FAO/WFP field assessments, indicated in the stacked zone.

Production is mainly rain-fed and concentrated in the Central and Southern regions, mostly in proximity to the Thai border. However, measuring production remains a challenge and much of the data on rice production is uncertain.⁶

Rice production increased

⁶ As discussed in Chapter 4, the measurement issues make an assessment of supply factors driving rice glutinous inflation challenging.

As the main staple food, rice has a major cultural and political significance. Access to rice is the single most important factor determining the welfare status in rural and semi-urban areas. People in Laos now consume up to 200 kilograms per capita of milled rice per annum, which constitutes almost 70 percent of their calorie and protein intake (EMC, 2011; FAO/MAF, 2009; ADB, 2006). Per capita rice consumption is thought to be among the highest in the world. Rice production, in levels, continued to rise. In particular, rain-fed rice production increased by 6 percent to 2.5 million tons in 2009 relative to the previous year. Meanwhile, irrigated rice yield rose by around 2

Map 1: Income from rice production is concentrated in the Central and Southern regions



Source: LECS4 and staff estimates.

The map shows rice cultivation as the main source of village income in 2008. Dark areas indicate relative concentration of rice income. Visible from the map is that rice cultivation is in relative proximity to the Thai border.

percent to about half a million tons. However, rice productivity, as measured by total rice area, remained almost constant. Total rain-fed rice area increased marginally to 3.8 tons per hectare in 2009 from 3.7 tons per hectare in 2008 while total irrigated rice area was unchanged at 4.7 tons per hectare. Achieving self-sufficiency in rice at the national level has been a top priority. It was achieved in 1999/2000. Over the past decade, growth in the rice sector has allowed farmers to increasingly switch from buffaloes to mono-axle tractors for land preparation. Today, about 70 percent of glutinous rice seeds come from the improved varieties compared to just 5 percent in the 1990s. As Lao farmers do not use much fertilizer or pesticides (FAO/MAF, 2009) this shift is thought to have played a significant role in productivity improvements (EMC, 2011).

Official data report steady production, and yield increases over the

past decade. As shown in Figure 1, total paddy rice production has grown from some 2 million tons in 2000 to more than 3 million tons in 2010. During this period rice productivity increased from about 3 to 3.5 tons per hectare. Altogether, the production trends clearly suggest significant improvements in rice production and productivity over the past decade. At the same time, official data are reported to suffer from shortcomings. For example, separate statistics for glutinous and non-glutinous paddy rice production are not collected (Schiller and others, 2006), and expert estimates report lower average yields than the official ones (EMC, 2011). Moreover, paddy production data are generated by first estimating planted areas in the districts, then using approximate district rice yields to derive district production. Production statistics at the provincial level are then calculated by the Ministry of Agriculture and Forestry. Each stage can be subject to

shortcomings and political bias (Bourdet, 2000). Finally, there are discrepancies between official paddy production and the actual rice consumption patterns observed from household surveys (FAO/MAF, 2009).

Consequently, there is uncertainty regarding current levels of national and provincial rice production. For example, field assessments indicate that aggregate rice production in 2010 may have decreased by 6 percent compared to 2009. Both paddy area and yields are estimated to be lower (FAO/WFP, 2011). These numbers differ substantially from government forecasts, though final data are yet to be released. However, to anticipate some of the discussion in the following chapters, it is unreasonable to associate the *possible* decline in production with the observed 50 percent peak in glutinous rice price inflation in mid-2010. This is because of the agricultural production cycle. Rain-fed lowland paddy is typically planted from May to June, with the start of the rainy season, transplanted in July, and harvested from October to November (Schiller and others, 2006). And rain-fed lowland paddy production represents 80 percent of annual output. The relevant rice supply indicator for the 2010 rice price hikes is thus the 2009 crop season. Expectations about the 2010 crop might have contributed to inflation, but this seems unlikely, as discussed in Chapter 4.

Production is rain-fed, concentrated in the Central and Southern regions, and in proximity to Thai border

Rice cultivation covers more than 80 percent of the total cropped area, but is unevenly distributed over provinces. It is estimated that some 90 percent of total rice production is in the lowland fields,

concentrated in the Central and Southern provinces. Map 1 shows spatial patterns of rice production in 2008. The Central region accounts for more than half of the total rice area and production output. Savannakhet province has the largest rice area of all provinces. It accounts for over 20 percent of national production. Vientiane and Khammuane also have large rice areas in the region. The remaining rice area is located in the Northern and Southern regions, which account for less than half of total production. Champasack and Saravane are the two major rice-producing provinces in the south. The north is characterized by mountainous terrain and contributes to some 20 percent of total paddy production. Of the three regions, the Northern region has the lowest yields. Rice production here is often based on slash-and-burn cultivation, despite government efforts to reduce this practice (ADB, 2006).

Production is distributed along three main ecosystems: lowland rain-fed rice, upland rice, and irrigated dry season rice. It is often claimed that 90 percent of the rice area is rain-fed, with the remaining being irrigated (EMC, 2011). But other estimates suggest that irrigation may in fact be more significant, reaching up to 25 percent of the total paddy area (FAO/MAF, 2009). Particularly in the lowlands, rain-fed rice dominates. Most of the rice production is subsistence-oriented; smallholders have an average farm size of less than 2 hectares. Although rice production is the single most important economic activity, accounting for about one third of the agricultural GDP, little rice is marketed. Estimates suggest that roughly 10 percent of the more than 3 million ton production capacity is actually marketed (Bourdet, 2000; ETC, 2011; Hill and Christiaensen, 2006). Other data suggests that the share

of marketed production is higher, and may reach about a third for non-glutinous paddy and 14 percent for glutinous paddy (FAO/MAF, 2009).

Although Laos claims to be self-sufficient in rice production, food security is still a challenge. Population growth is one of the main determinants of rice consumption over time (Bourdet, 2000). With the population growing at 2.2 percent per year, the demand for rice is expected to grow substantially, requiring yield increases. Moreover, despite the overall good performance of the rice sector, not all households are able to permanently meet their rice consumption requirements. About one third of the population has food deficits for several months. And half of the children in rural areas are reported to suffer from chronic malnutrition. Laos' economic growth experienced over the past decade thus may not have been inclusive enough to result in an improved nutritional status of the rural population (WFP, 2007).⁷

Mixed evidence on market integration

Because of its small market size, temporary trade restrictions, and shallow annual surpluses, Laos is exposed to large price fluctuations. This can stem from domestic supply shocks and regional developments. The total size of the Lao rice market is less than 10 percent of the market size of Thailand. Some observers argue that due to subsistence production and regional price disparities, overall market integration maybe limited

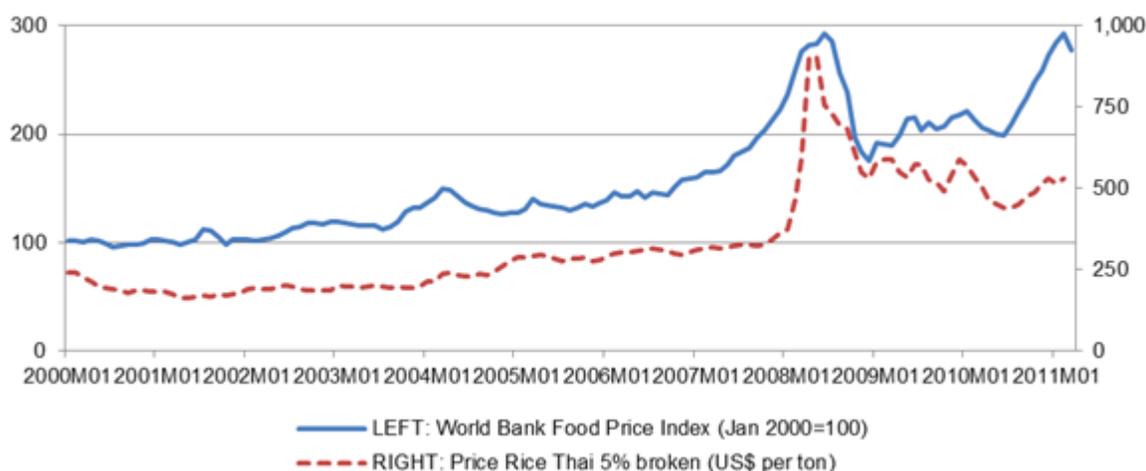
⁷ Another interpretation is that this may be an indication of glutinous rice trade, as main production areas are located across the Thai border.

(Bourdet, 2000; van der Weide, 2006), even though market integration in general may have improved over time, possibly due to investments in transport infrastructure and market institutions (Andersson and others, 2007; Takamatsu, 2002). But the importance of rice trade within Laos and to neighboring countries is sparsely documented and hence constitutes a knowledge gap. It is also possible that market integration may have improved over time due to infrastructure investments. In fact, some studies observe temporary rice trade flows to Vietnam, Thailand, and possibly China (Segue and others, 2009; GSD, 2005). Paddy trade is also encouraged by the underdeveloped milling sector. Most of the rice mills are small family-run operations often delivering a poor-quality product. It is not unusual therefore for farmers and merchants to take paddy across the Thai border to more efficient mills that are capable of turning out a high-quality product, which then is eventually imported back to Laos. In addition, milling around the Mekong River in Laos is done by a relatively large number of commercial mills. Rice traders often own these private mills. Altogether, there are conflicting findings regarding the actual size of cross-border trade. The evidence on national and regional market integration is inconclusive.

3. RECENT FOOD AND RICE PRICE TRENDS

This chapter looks at trends in world and Lao prices and its implications. It describes the evolution of world and Lao food and rice prices. The focus is on glutinous and non-glutinous rice. The chapter shows that there has been a small impact of world food prices in Laos. The behavior of glutinous and non-glutinous

Figure 2: World food prices are high but rice did not increase as much as in 2008



Source: World Bank DECPG.

The graph shows the evolution of world food prices (left) and Thai rice price (right) from January 2000 to March 2011. Visible are the world food price peaks in 2008 and 2011. Thai rice prices increased enormously in 2008, but since then appear more stable.

rice is substantially different. Glutinous rice dominates food price inflation and in the medium run may contribute to trigger overall price inflation. While the macroeconomic impact has been small, price developments need close monitoring. Analysis undertaken for this policy brief suggests that the majority of the farmers have marginally benefitted from glutinous rice price increases. But high prices have had adverse effects on the welfare of urban and food-deficient population groups.

World food price changes are less pronounced for rice than other food items

Rapidly rising world food prices coincide with rice inflation in Laos. It is hence important to understand recent trends. Figure 2 shows the World Bank's food price index for January 2000 to March

2011.⁸ The index increased by over 30 percent from January 2010 to March 2011, now being close to its peak in June 2008. The index is constructed from several components, and all major ones have risen sharply, but among individual commodities, sugar, edible oil prices and staple crops have risen most rapidly. Importantly, rice prices have been rather stable, which is a key difference from the 2006-2008 food crisis. Some observers argue that rice price increases in 2006-2008 were triggered by export bans in major Asian rice producing countries. As described in Box 1, these harmful policy responses have not occurred during the

⁸ The World Bank's food index comprises major agricultural commodities with large shares in international trade, and those shares determine the weight of each commodity in the index. Food items generally have an international reference price. Trends are very similar with the food price indices from FAO or the IMF.

Box 1: Rice and trade in the 2006-2008 and current food crisis

Despite some parallels, the current food price rise differs in important ways from the 2006 to 2008 crisis. The rise has been led by sugar, cooking oils, and a few staple crops such as wheat. A crucial difference is that good harvests have kept the international price of rice relatively stable. Moreover, the domestic prices of staple foods in many developing economies have fallen, in contrast to the increases seen in 2006 to 2008. Robust rice harvests in Asia and strong harvests in Africa thus account for much of the more limited international rise and lower domestic prices (Shimelse and Eidelman, 2011).

The 2010-2011 food crisis also offers an important trade policy lessons. Major rice producing countries did not issue export bans. These may have accounted for some 45 percent of the rice price increases in 2008 (Martin and Anderson, 2011). Measures to secure access to domestic food Supplies had a snowball effect, as other governments also took preemptive measures, contributing to a further surge in world rice prices that no government would have wished for (Brahmbhatt and Christiaensen, 2008). While more than 20 countries imposed export restrictions in 2008, only a few did in 2010.

2010-2011 food crisis, which partly helps in explaining stable international rice prices.

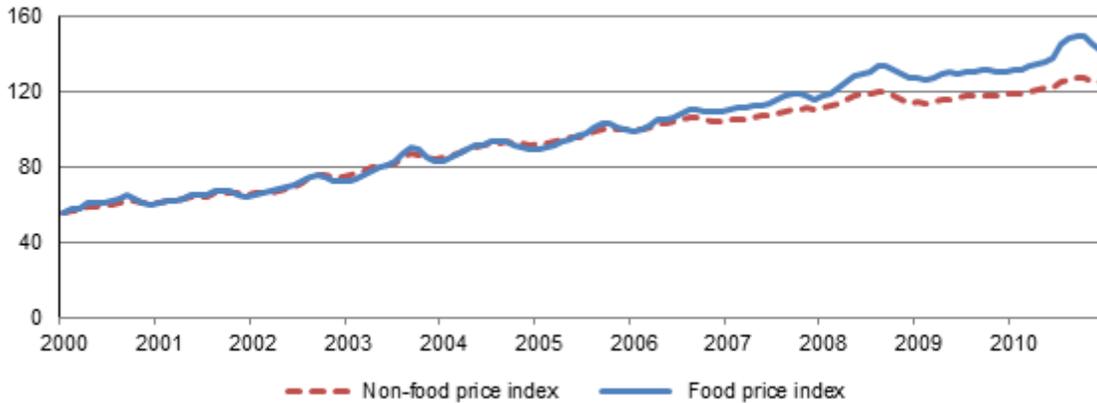
Importantly, rice prices in Vietnam and Thailand, Laos' giant rice producing neighbors, are stable. Global rice prices in March 2011 were unchanged relative to a year earlier, and on the whole, the benchmark price is roughly 32 percent below the peak attained during the 2008 crisis. Good harvests in the key exporting countries Thailand and Vietnam, and global stocks at the highest level since 2002 have generally put to rest anxieties about upward pressures on the export price of rice. Production uncertainties had initially contributed to an 18 percent price increase between June and December 2010 and led to large imports to complement domestic stocks. As a result, domestic rice prices have moderated recently (World Bank, 2011).

The single most important factor underpinning world food price surges are weather-related supply shocks. Production shortfalls in wheat, barley and other grains have occurred notably in Russia and the Ukraine since June 2010. Additionally, Russia and the Ukraine imposed a wheat export ban in August. The European Union, Canada and the

United States have also experienced disappointing yields. These factors, have outweighed favorable production outcomes in Argentina and Australia, and induced large draw-downs in food stocks, thereby tightening global supply. Another leading factor has been the weakening of the US dollar since mid-September, which continues to sustain the prices of nearly all agricultural and non-agricultural commodities. On the demand side, strong economic growth in emerging economies during 2010 has also contributed to the rise in commodity food prices.

Food price increases are also linked to energy price increases. Crude oil prices surged by 10.3 percent in March 2011, and were 36 percent higher than a year earlier. These oil price increases impact on food prices. Estimates suggest that a 10 percent increase in crude oil prices may be associated with a 2.7 percent increase in the World Bank food price index (Baffes, 2011). Multiple transmission channels are at play. First, higher crude oil prices encourage greater use of food products such as corn, vegetable oil, and sugar in the production of biofuels in developed and emerging economies. Second, higher energy prices

Figure 3: World food prices slowly transmit into Lao food prices



Source: Lao National Statistical Bureau.

The graph shows the evolution of the Lao consumer and food price indices from January 2000 to December 2010. The base of the index is December 2005. Visible is that in 2006 both indices start to drift apart.

feed into the cost of food production through higher fertilizer prices, the cost of irrigation, and other farm inputs. The extent of energy price impact varies significantly depending on the type of crop and level of mechanization. A third channel of energy price impact is through the increases in the costs of crop transportation to destination markets, leading to larger price variations domestically and higher costs for importing countries (World Bank, 2011).

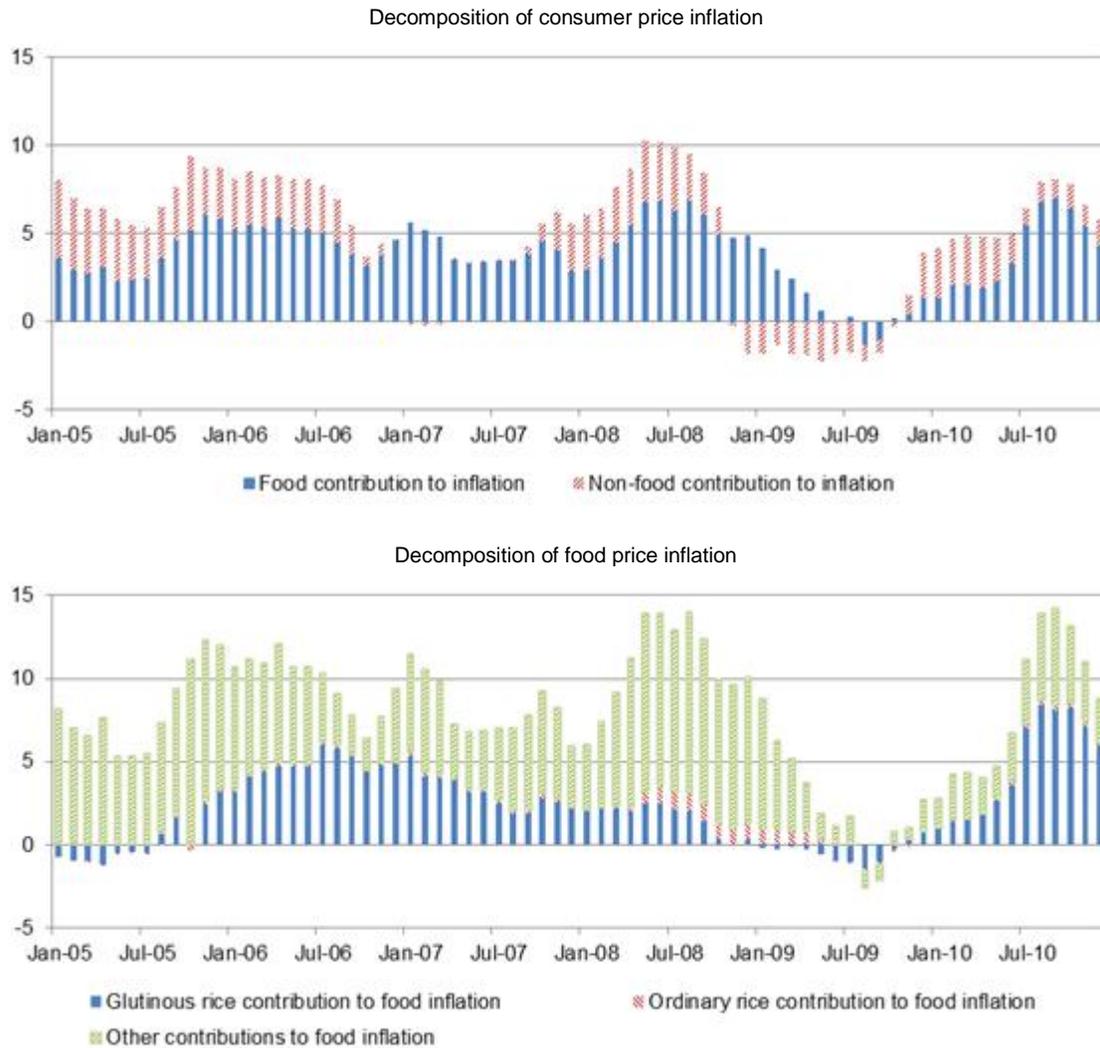
Small impact of international food crises on Lao prices

The 2006-2008 global food crisis had a small short-run impact. One view is that Laos by and large escaped the global food crisis in 2006-2008 because of its limited exposure to international trade in food and national self-sufficiency in rice (World Bank, 2009). A vast majority of the poor live in rural areas and produce enough rice for own consumption. The macroeconomic impact was also small. Annual consumer price inflation rate increased to only 10 percent in mid-2008,

while inflation of food consumer prices peaked at 14 percent in August 2008, much lower than in many other developing countries.

Over the medium run, world food price changes are transmitted slowly to domestic prices. In Laos, food prices have risen faster than non-food prices since 2006. Thus, in spite of the small impact of the world food crisis there is a relationship with the evolution of domestic prices. Figure 3 shows the consumer price indexes and food prices from January 2000 to December 2010. The food share in the consumer price index is 40.9 percent. The two series start to deviate in 2006, when food prices rise quickly, reaching a peak in mid-2008. Both series decline in late 2008, and then start to rise slowly. In mid-2010, food prices begin rising, while non-food prices remain stable. As a result, between January 2006 and December 2010, food prices rose by 42.6 percent while non-food prices rose by only 13.4 percent. This is a difference of close to 30 percentage points. Hence, there is a structural change in the relationship

Figure 4: Glutinous rice prices drive food prices and overall inflation



Source: Lao National Statistical Bureau and staff calculations.

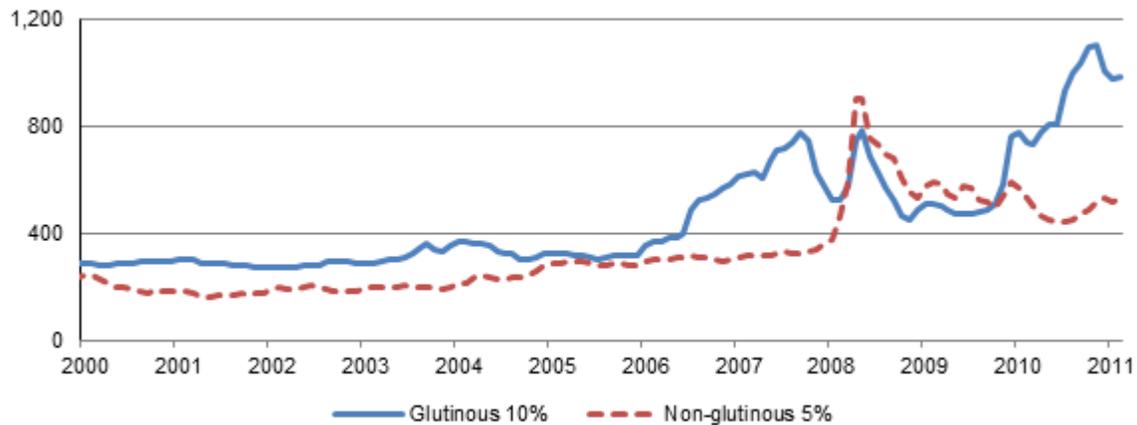
The graphs show a decomposition of the monthly food and consumer price indices from January 2005 to December 2010 using CPI weights and individual growth rates. Visible is that overall inflation is below 10 percent and almost entirely driven by food prices. Food price inflation itself is determined in 2006-2007 and 2010 by glutinous rice inflation. Ordinary rice has a barely visible impact in 2008 and 2009.

between food and non-food prices around 2006, and it seems to be related to world market prices, which also started to increase in 2006. At the same time, the link between the world food price index and Lao food price index is sluggish and not very tight.

Changes in Lao food prices are almost entirely dominated by glutinous

rice prices. Rice is the main staple crop and consequently an important food item in the consumer price index, with a weight of 7.3 percent in the basket. One way of highlighting the importance of food and rice prices is to decompose annual changes in the overall consumer and food price indices. Figure 4 shows that inflation in 2010, and in the previous years, is mainly the result of food price

Figure 5: Thai export prices differ for glutinous and ordinary rice



Source: Thai Rice Exporters Association.

The graph shows the evolution of the Thai glutinous and ordinary rice from January 2000 to February 2011 measured in US\$ per ton. Visible is the spread of both series in particular in 2006 and 2009.

increases, which explain some 70 percent of overall inflation. Food prices, in turn, are influenced by glutinous rice price increases, in particular during 2006 to 2007 and in 2010. The contribution of rice price inflation is much larger than its weight because of the enormous glutinous rice price increases. Ordinary (non-glutinous) rice prices play almost no role in explaining overall food inflation. Not visible in the graphs are other, indirect effects. For example, it is likely that the jump in rice prices also has a strong effect on other food and non-food prices, partly because rice is an input in the production of many other goods, such as beer and restaurant meals, and partly because higher rice prices create a demand for higher wages. In fact, the Lao Federation of Trade Unions, the Ministry of Labor and Social Welfare and National Chamber of Commerce and Industry agreed in principle to increase the minimum wage because of high food prices (Lao Voices, January 18, 2011).

Glutinous rice changes differs substantially from ordinary rice

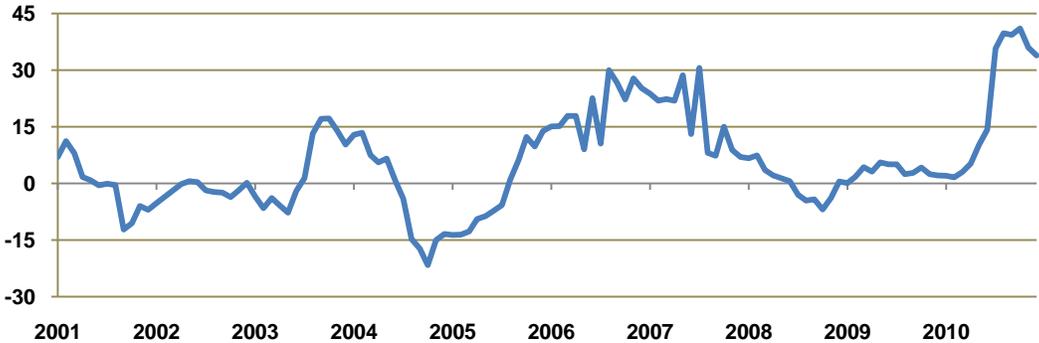
The evolution of world market prices for glutinous and non-glutinous rice differs substantially. This difference probably explains the weak short-run relationship between world and Lao food inflation. Glutinous rice trade has a small share in the world market. It is estimated at less than 10 percent, and thus not well-covered by the world food index. But for consumption and inflation in Laos it matters more than non-glutinous rice. About 85 percent of the rice produced is glutinous, and its weight in the consumer price index is 6.2 percent compared to 1.1 percent for non-glutinous rice.⁹ The price of glutinous rice is thus a key factor for food inflation in Laos. Figure 5 depicts US\$ prices of Thai exports of glutinous

⁹ The National Statistical Bureau is in the process of revising the weighting scheme based on LECS4. The food and rice shares will likely be slightly larger.

(10 percent broken) and non-glutinous (5 percent broken) from January 2000 to February 2011. The prices represent the world market price of rice, since Thailand is the largest rice exporter in the world. The prices have evolved very differently,

Glutinous and non-glutinous rice are not close substitutes. In the two countries where glutinous rice is consumed as a major staple food, Laos and Thailand, demand is probably highly price inelastic since non-glutinous rice is generally not

Figure 6: Lao glutinous rice inflation in real terms reaches a decade-high in mid-2010



Source: Lao National Statistical Bureau.

The graph shows real annualized monthly glutinous rice inflation from January 2001 to December 2010. The rice prices are based on real consumer price index data (January 2010=100). The overall high volatility and the peaks during the 2006-2008 food crisis and recently, in 2010, are evident in the graph.

particularly after 2005. Glutinous rice prices increase sharply during 2006, presumably in line with other world market food prices, while non-glutinous rice prices are stable until early 2008, when they shoot up. Both prices start declining after May 2008, but while the non-glutinous rice price drops from US\$ 907 in May 2008 to US\$ 529 in February 2011, the glutinous rice price starts rising in 2009, and thus increases from US\$ 783 to US\$ 983 over the same period.¹⁰

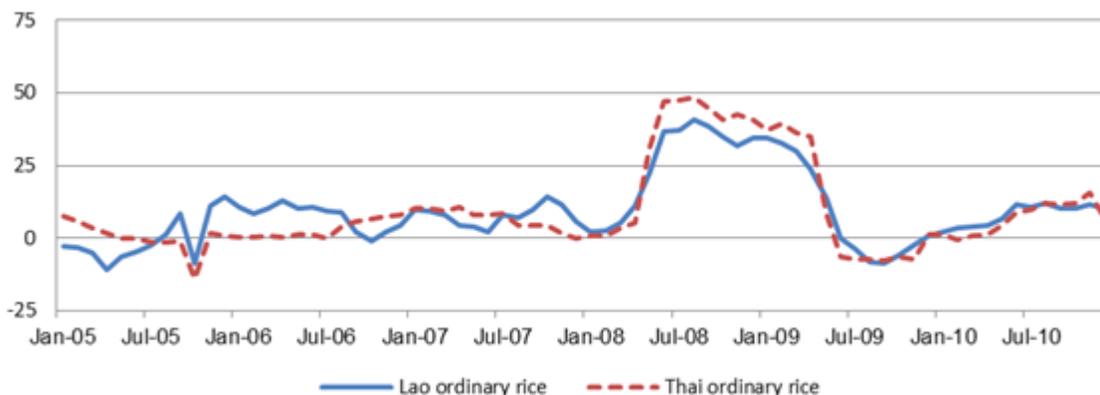
viewed as a substitute by most people. In other Asian countries, such as for example Vietnam, where typically minor quantities are consumed, glutinous rice is used for preparing breakfast meals and sweet dishes for special occasions, making substitution impossible. Hence, demand for glutinous rice does not respond much to rice price differences. The two types of rice are nevertheless substitutes in production, as farmers can switch between them. However, this mechanism does not seem to have had an impact on prices during recent years.

Lao glutinous rice prices are volatile. Figure 6 shows annual percentage changes in prices of glutinous rice for 2000 to 2010. Prices rose by over 50 percent between late 2009 and late 2010,

overall inflation in Thailand and Laos has been low.

¹⁰ Price series in this report are mostly presented in nominal terms for transparency. Deflating the series (for example by consumer prices) shows the same visual impressions for rice price trends in real and nominal terms. The reason is that, over the past few years,

Figure 7: Lao and Thai ordinary rice prices only increased moderately



Source: Lao National Statistical Bureau.

The graph shows annual (year-to-year) growth rates of monthly ordinary rice inflation. The rice prices based on consumer price index data. Visible is overall high volatility peaking in 2006 and particularly in 2010.

and even though they started to decline due to supply increases in the (main) harvest period (October-November), annual inflation was over 40 percent in December 2010. It is noteworthy that glutinous rice inflation was never over 30 percent during the 2006-2008-food crisis. Overall, glutinous rice prices must be considered highly volatile, since over the past decade annual inflation rates varied between minus 15 and up to 50 percent.¹¹

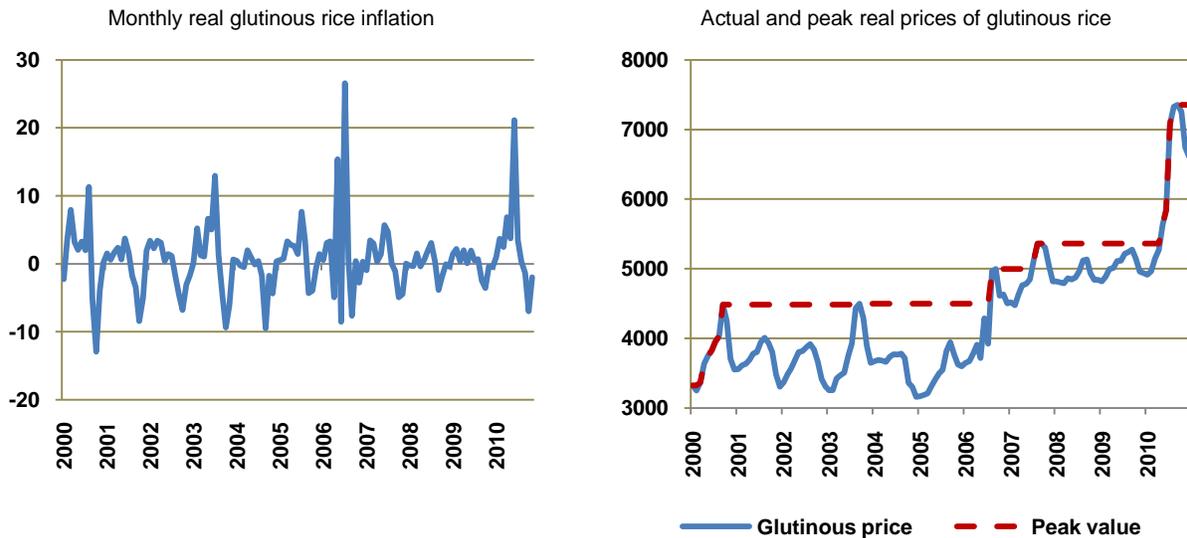
Non-glutinous rice prices only increased moderately during 2010. Annual inflation rates for Lao and imported Thai non-glutinous rice, sold in Laos, are depicted by Figure 7. The figure highlights three interesting facts. First, non-glutinous rice inflation rates barely exceeded 10 percent during 2010. Second, Lao and Thai non-glutinous rice

are close substitutes, their prices move together quite closely. Third, the rice-price shock in 2008 was to some extent transmitted to Laos, as non-glutinous rice inflation increased to over 40 percent. However, world market prices rose by over 60 percent, but then declined rapidly. In Laos both the increase and the decrease were clearly smaller. As a result, from January 2008 to January 2010 prices increased by 46 percent in Laos, while the world market price (Thai export price) decreased by 9 percent.

The swings in annual inflation rates last for several years. This suggests that the volatility is not due to seasonal factors. Figure 8 shows monthly inflation rates from January 2000 to December 2010. The volatility observed in the annual inflation rates is due to a few prices shocks: there were large price increases in 2003, 2006 and 2010, which (so far) have not been followed by large price decreases. Figure 8 also shows several periods with a strong seasonal pattern, but price changes are small, at least in relative terms, and only last for a couple of months. The role of price shocks is highlighted by depicting prices

¹¹ Moreover, extending the series back includes short episodes with rice inflation rates of over 100 percent in 1998. This is associated with the 1997 Asian financial crisis and subsequent macroeconomic turmoil in Laos.

Figure 8: Swings in glutinous rice prices in real terms last for years and are not seasonal



Source: Lao National Statistical Bureau and staff estimates.

The left graph shows the month-on-month real glutinous rice inflation from January 2000 to December 2010 based on consumer price index data (January 2010=100). Visible are seasonal factors in the ± 10 percent range. Prices typically peak in August and, with the beginning of the harvest period, decline in November. There are extreme monthly jumps in 2006 and in 2010. The right graph shows that after any given price shock prices, measured in Kip per kg, stay high.

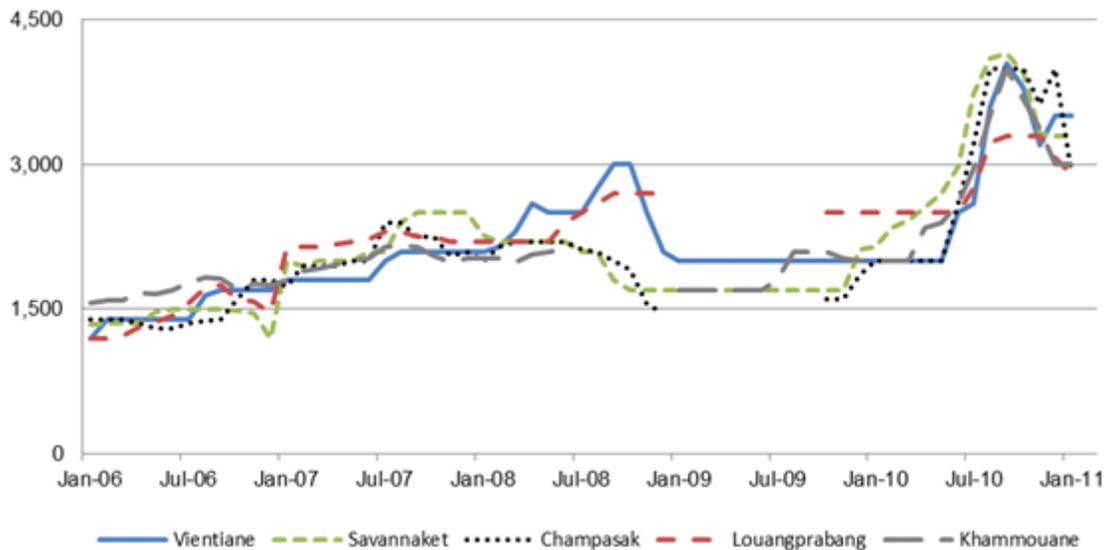
and price peaks (see Figure 8). Since there is overall inflation, one should expect an upward drift in price levels. Nevertheless, the price shocks are undoubtedly the main drivers of the upward movements in prices; after a price shock they always stay at a higher level.

The increase in rice prices has affected large parts of the country. The reported Lao rice prices are used when calculating the consumer price index. These are collected in large markets of provincial capitals and not in rural areas or small towns. Since the rice market in Laos is perceived to be highly segmented, and rice prices in remote rural areas differ due to transport costs, there is uncertainty regarding measurement of the impacts of rice inflation. According to the Lao National Statistics Bureau, however, rice prices should be broadly representative for major rice-growing areas and hence

for most of the population. Disaggregated and regional data are typically not shared.

There is a lack of good regional price data, but the available price series show similar patterns. The Ministry of Industry and Commerce also collects price information for five province capitals on various types of rice. This information is sometimes available at disaggregated levels, which allows comparing the evolution of regional price trends. Figure 9 shows average prices for glutinous paddy over January 2006 to February 2011. Even though price levels vary across the country, as documented by van der Weide (2006), the price series follow each other closely in major cities. Moreover, all prices rose sharply in 2010, though somewhat less in Louang Prabang, a city in the Northern region. Another striking feature of Figure 9 is the long periods with stable prices. Even though this to some extent is an artifact of

Figure 9: Regional paddy price trends follow each other



Source: Lao Ministry of Industry and Commerce.

The graph shows regional paddy prices from January 2006 to February 2011 measured in Kip per kg. The figure shows that regional price trends move in par. Also visible are data gaps and constant prices over prolonged time periods, suggesting data quality issues.

rounding to the nearest 1,000 Kip, the quality of the data is questionable. During some periods the series do not show *any* movements, which is unlikely for prices in a market economy. The gaps also exist because it is challenging for the authorities to compile the information for all regions.

Overall, for the last five years, the evolution of glutinous and non-glutinous rice prices differs substantially. It is essential to distinguish between non-glutinous rice, which is consumed in relatively small quantities, and glutinous rice, the staple food. Glutinous rice prices rose sharply during 2010 and are still high, even though they have declined recently, while non-glutinous rice prices have been modest. Moreover, in Laos the volatility of glutinous rice prices is a major determinant of food price inflation. At the same time, recent food and rice price increases do not constitute a major threat to overall price stability. Consumer

price inflation stood at 6.0 percent in 2010. However, the large rice-price increases during 2010 created uncertainty among government and market actors, and had welfare and distributional effects. It is thus vital to understand why these prices rose so sharply.

Macroeconomic impacts of rice inflation are small but need monitoring

World food inflation does not constitute a major challenge for macroeconomic stability in the short-run. Overall inflation rates are moderate but rising (recorded at 9.2 percent in April 2011). In several developing countries, the food price crisis in 2006-2008, in combination with high oil prices, created macroeconomic instability in the form of high inflation, exchange rate instability and current account deficits. But the impact on Laos was limited. So far current world food

Table 1: Approximate welfare impacts suggest negative effects of rice price increases in the Northern region and for urban population

Estimated short-run household welfare impact from December 2009 to December 2010 (in percent of initial household income)			
Region	Urban	Rural (with road)	Rural (remote)
VIENTIANE	-1.4	9.2	NA
NORTH	-0.6	0.7	-3.2
Phongsaly	-1.0	-2.8	-3.6
Luangnamtha	-1.3	3.4	-6.5
Oudomxay	-2.9	-2.2	-3.1
Bokeo	-0.0	11.4	9.2
Luangprabang	-2.4	-0.8	-3.1
Huaphanh	-2.6	0.0	-1.4
Xayabury	3.0	1.4	-6.7
CENTRAL	2.4	3.6	-3.3
Xiengkhuang	2.3	4.0	-5.1
Borikhamxy	-2.4	2.7	-2.0
Khammuane	-2.2	-0.5	0.6
Svannakhet	3.7	4.8	-3.9
SOUTH	-1.3	-0.3	4.2
Saravane	-2.3	-0.0	-2.8
Sekong	-4.3	-5.8	10.5
Champsak	-0.9	0.0	3.9
Attapeu	-1.2	-0.0	1.1

Source: LECS4 data based on Davis and Baulch (2011) and staff calculations.

inflation does not seem to have affected Laos much either, even though international trade has increased and the country gradually becomes more integrated with the world economy. Price transmission is slow because it goes from the international to the regional market, and then from the regional market, to the domestic market.

In the medium run, world food prices may well transmit into the domestic market. Some degree of regional food

price transmission is already evident through the observed rise in relative food prices observed in Figure 2.¹² Glutinous rice price changes have a strong impact on domestic inflation, particularly food inflation. In fact, glutinous rice is the food item that has the strongest impact on domestic consumer prices, both directly

¹² See also Chapter 5 for a more detailed analysis.

due to its weight and indirectly due to its role as staple food. Since the evolution of glutinous rice prices is determined in the region, at least over periods of a couple of years, the 2010 inflation spurt is probably a regional phenomenon. Non-glutinous rice prices also impact consumer prices, but more modestly.

Price stability depends critically on glutinous rice prices. Both domestic glutinous and non-glutinous rice prices are currently stable. But international food prices are highly volatile and have reached all-time highs. Oil prices are well over US\$100 and might continue to increase. Moreover, the development of the regional glutinous rice markets remains unclear. Hence, there is great uncertainty about how food and fuel prices will impact the macro-economy over the next couple of years. Macroeconomic policy measures also need to be based on the extent that commodity price increases feed into wages, and can create inflationary expectations, which are often viewed as one of the most important contributors to inflation. Current rice price inflation in Laos is also taking place in the context of already high private credit growth, which itself contributes to overall inflationary pressures of consumer prices. All this suggests a need for close monitoring.

Marginally positive overall welfare impacts of rice price increases, but urban and food-deficient areas lose

Rice inflation has marginally positive overall welfare impacts. Household survey data suggest that the overall net welfare impacts of rice price increases from 2009-2010 are marginally positive. A uniform 10 percent increase in rice prices raises ‘average’ household welfare

by 3.3 percent.¹³ Households thus on an average gain from high rice prices.

But urban and some food deficit areas are hurt. Higher prices benefit the average rural household at the expense of urban and food-deficit households. Looking beyond national averages, as documented in Table 1, suggests that actual welfare effects vary by remoteness and province (though the results for some areas seem implausible and could be an indication of data quality issues). Areas where households produce rice surpluses, generally gain from price increase, urban households suffer slightly, while remote rural households, mostly in the food-deficient Northern provinces, no doubt are negatively affected. These findings are consistent with analysis on rice inflation undertaken for neighboring countries and previous work for Laos (World Bank, 2009).¹⁴

4. TRADITIONAL SUPPLY AND DEMAND FACTORS ARE MINOR CAUSES OF RICE INFLATION

This chapter discusses potential determinants of rice price inflation. Several potential explanations have been suggested for the 2010 price hike. They

¹³ The methodology of the welfare approximations is documented in the annex.

¹⁴ On the distributional patterns of glutinous rice inflation, Takamatsu (2011) finds that the negative welfare changes for urban households do not vary much by expenditure quintiles. But the size of the positive welfare increases in rural areas is higher for the more wealthy households.

range from purely seasonal factors, large supply shocks, increases in aggregate demand, expansionary monetary policy, increases in input prices, hoarding by government institutions, and speculations by millers and traders. One cannot rule out some contribution of domestic rice supply shocks in the light of data uncertainty. But the main finding is that none of these are plausible enough to explain major price peaks of 50 percent inflation.

Seasonality effects are existent but of small magnitude

Seasonal differences between rice prices in Laos are relatively modest. Among the most straightforward explanations for staple food price fluctuations are seasonal changes in domestic supply. In Laos, however, their magnitude is only of intermediate importance. For instance, intra-seasonal differences between maximum and minimum prices of maize in Southern Africa are usually between 25 and 100 percent (Chapota and Jayne, 2009). Differences between maximum and minimum glutinous rice prices in Laos are much smaller, around 10 percent according to average wholesale prices.¹⁵ On the other hand, over the past decade, inter-seasonal fluctuations, well above 10 percent (same month across years) have been common.

Seasonal rice price fluctuations exist even in well-functioning markets. It is worthy to note that while fluctuations in

¹⁵ This estimate is probably at the lower end as it is based on aggregated prices. Yet, individual market prices, collected by Ministry of Industry and Commerce, move even less.

rice prices are considered a problem, they fulfill the role of adjusting production to changes in demand and supply. Hence, even in well-functioning markets for staple foods, prices vary over the season.

Past supply shocks do not show strong correlation with rice prices

There is little correlation between changes in rice supply and prices. Bad harvests increase prices while good harvests reduce prices. But as Figure 1 in chapter 2 shows, according to official estimates the harvest has increased every year since 2000, except in 2003 when it declined by 1.7 percent. As described above, there was a significant price increase in 2003, indicating a supply shock, but the price increases in 2006 and 2010 do not coincide with declines in harvests in 2005 and 2009.

None of the data seem to contain supply shocks that are large enough to be the main cause of the huge price fluctuations. However, since the official estimates of harvests are known to be uncertain and likely to have substantial margins of errors, it is hard to assess the true role of supply shocks. An indication of uncertainty is that estimates from the Food and Agricultural Organization (FAO) and the World Food Program (WFP) suggest that the harvest in 2010 will be 6 percent lower than in 2009 (FAO/WFP, 2011), differing substantially from government forecasts. Nonetheless, taken at face value, none of the data seem to contain any supply shocks that are large enough to cause glutinous prices to increase by 50 percent annually.

It also seems unlikely that jumps in the marketed share generated the observed inflation dynamics. Changes in marketed shares of the harvest can be a cause of price fluctuations, but it is

challenging to empirically evaluate their importance. A more subtle argument in favor of supply shocks is based on the fact that farmers use most glutinous rice for self-consumption, and that small changes in harvests, or expectations of future harvests, can potentially produce large changes in both supply and demand for rice. The reason is that farmers retain a larger share of their produce when harvests are small, reducing supply, and a larger number of households fail to produce a sufficient amount of rice, thus increasing the demand for rice (Bourdet, 2000). Yet, it is not at all certain that the dynamics described are correct. Although glutinous rice is the staple food, it is possible that high market prices induce farmers to sell more rice, replacing it in their diet with other types of food. Since the amount of rice retained for own consumption is so much larger than the marketed rice, small changes in diets might stabilize supply, and subsequently prices.¹⁶ Moreover, the demand effect might be small because farmers who lack rice also lack buying power. Since there is a paucity of information on marketed rice and the structure of the rice market, the relevance of these two hypotheses is hard to evaluate, though currently no credible market information supports the claim that high retention caused the 2010 price inflation.

Increased demand over the past decade does not explain fluctuations

Changes in aggregate demand do not explain the fluctuations either. There are several reasons why demand for rice could have increased. Economic growth

¹⁶ Around 88 percent is retained according to Hill and Christiaensen (2006).

increases household income and thus aggregate demand. Laos has had growth rates in the 7-8 percent range since 2004. One argument why higher income might generate more demand for glutinous rice rather than other goods is that about one third of the population is thought to be temporarily food-insecure. It cannot satisfy their demand for rice during parts of the year (WFP, 2007; FAO/WFP, 2011). But there are two countervailing arguments. First, average yearly GDP growth has been high for ten years, and there are no obvious demand shocks that can explain sudden price hikes, such as the one in 2010. Second, demand for glutinous rice, as staple food in general, is relatively income inelastic, as it does not grow in line with income (Bourdet, 2000).

Also the role of beer production and high-potential growth sectors for rice demand is small. Other potential sources of demand are Beer Lao, that uses rice to brew beer, and mining companies that buy rice for their employees, but they are of minor importance. Beer Lao is a big buyer of rice, close to 10,000 tons in 2010, but it mainly buys non-glutinous rice, and thus has little impact on glutinous rice prices. Moreover, a substantial part is imported from Thailand, where milled non-glutinous rice tends to be cheaper (EMC, 2011). Mining is capital intensive and only 0.6 percent of Lao households were involved in the mining and hydropower sectors in 2007 to 2008 (Fenton and Lindlow, 2010). Hence, the number of employees in mining is not large enough to have a nation-wide impact on rice prices.

Increasing input prices do not explain rice price increases either. The costs of fertilizer have risen significantly, as oil prices have surged. However, fertilizers and pesticides are not widely used by Lao farmers (FAO/MAF, 2009). Another

input is seeds, but optimally farmers should change them every four years, and in practice do it less often. Moreover, government institutions dominate the seed market, and there is no information about recent large price increases.

Monetary policy does not explain sudden price jumps

There is an overall lack of correlation between aggregate credit supply and rice prices. Expansionary monetary policy is sometimes believed to cause food price increases. The mechanism goes through reduced interest rates and improved access to credit, which reduces the cost of storage for market actors, such as millers and traders. As a result, storage increases, supply drops, and prices may increase or even over-shoot. This hypothesis has been put forward by Frankel (2006) to explain changes in world commodity prices. But the pattern of credit growth is not consistent with price changes. Private sector credit has grown rapidly during recent years (an increase of about 80 percent yearly between 2008 and 2010 according to the IMF, 2011). It thus could be a potential cause of price increases (also impacting on the price of land). Yet, there is no reason why several years of easy credit should generate the observed *sudden* price shock in 2010. Thus, the overall lack of correlation between credit supply and prices rules out expansionary monetary policy as a major driver of rice price inflation.

Hoarding and speculation are unlikely

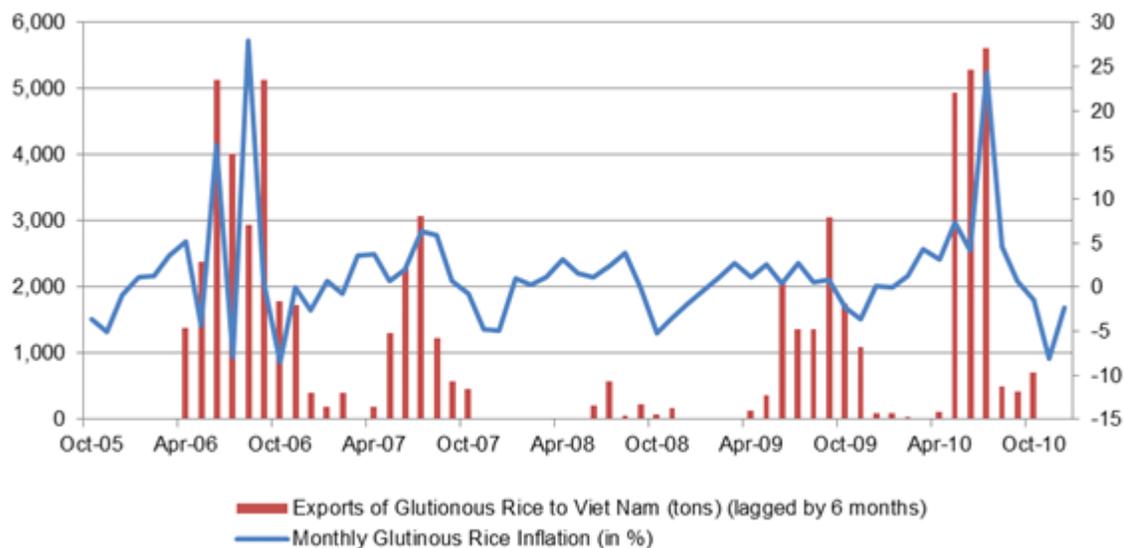
There is no evidence suggesting major increases in government purchases caused the price increase. Another potential cause for price increases could

be hoarding by government institutions. For example, the State Food Enterprise buys rice for government staff during harvests and sells stocks during shortages (World Bank, 2009). However, it appears to have not been very active in storing large quantities of rice recently. Government agencies, such as the army and police, also buy rice from millers using quotas, which are allocated to millers at a price fixed early in the season. While the size of the quota market is not insignificant,¹⁷ field evidence in the main rice-producing provinces does not indicate a significant jump in the quota market share.

Speculation among farmers, millers and traders had a limited or no effect on non-glutinous rice. Although speculation due to the availability of cheap credit seems unlikely, expectations about future harvests might matter. In 2010, glutinous rice prices started to increase between May and June, and this coincided with the beginning of the main wet season, complemented by localized droughts and flooding towards the end of it. For some observers this may have led to hoarding of rice, and is a major reason for price increases according to FAO/WFP (2011). Yet, speculation should also have affected non-glutinous rice prices. But they only rose by 10 percent. It is of course possible that non-glutinous rice prices are determined by world market prices, while glutinous prices are determined by demand and supply in the local market, but there is no obvious reason as to why this should be the case. Finally, one cannot rule out that millers and traders stored large amounts of paddy while prices were rising, but then prices should have

¹⁷ Some observers estimate the quota market share between 10 to 25 percent.

Figure 10: Glutinous rice trade to Vietnam is associated with price jumps



Source: Lao Ministry of Industry and Commerce and National Statistical Bureau.

The graph shows percentage increases of month-to-month glutinous rice inflation and official glutinous rice exports to Vietnam from October 2005 to December 2010. In the graph exports have been lagged by 6 months to highlight the relationship. Visible is that the rice inflation peaks in 2006 and 2010 are closely associated with large exports to Vietnam. Trade data for Thailand shows similar patterns but the magnitude of officially registered exports is very small when compared to Vietnam.

declined *before* the harvest, as there is no point in holding on to stocks when prices are expected to fall. Prices started to decline slowly in October, as expected, and were well above previous year's values in late February, so large stocks do not seem to have been released.

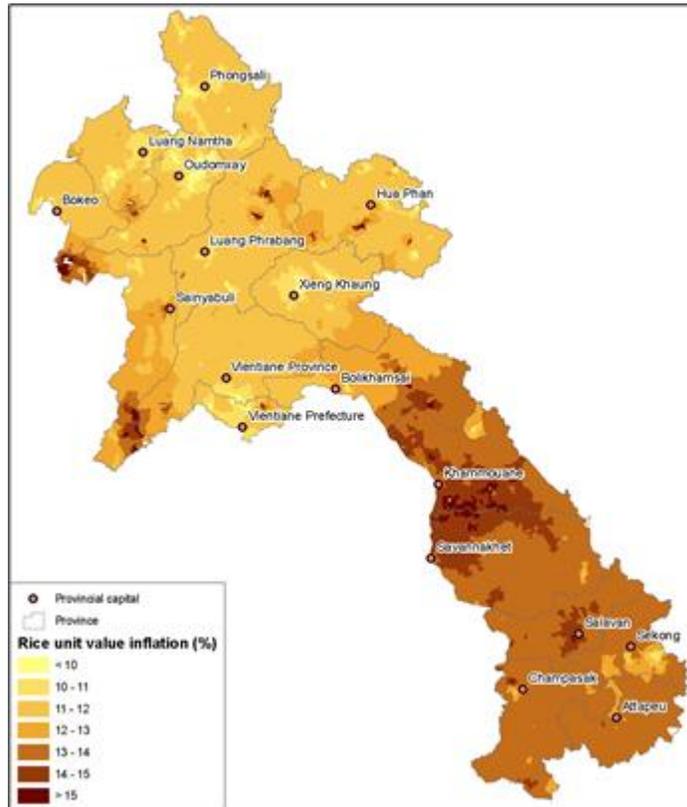
5. RICE TRADE AND POLICY AS MAJOR CAUSE OF RICE INFLATION

The most likely cause behind the mid-2010 price increase is significant exports of milled glutinous rice to Vietnam and paddy to Thailand. This chapter argues that regional trade, and domestic trade policy, plays a crucial role in the determination of both glutinous and non-glutinous rice prices. Several pieces of empirical evidence suggest that trade triggers price increases, which are likely

reinforced by ad hoc trade policy decisions. By contrast, it is challenging to obtain credible and consistent support for other hypotheses outlined in the previous section. This of course does not imply that supply shocks and speculation, are entirely unimportant. In principle it is possible that major supply shocks are *regional*. They could affect Laos, Thailand and Vietnam simultaneously.¹⁸

¹⁸ This could have been the case in 2010 when floods, which may have caused crop damages for glutinous rice, hit Northeastern Thailand. Thus, future analysis should look at Thai glutinous rice production trends and see to what extent they explain price volatility. This is because trade may be the proximate

Map 2: Rice price inflation is highest in producing areas that also trade with Vietnam and Thailand



Source: Staff estimates based on LECS3 and LECS4.

The map shows average annual glutinous rice inflation over 2003 to 2008. The parts of Laos that are believed to be most active in producing and exporting glutinous rice to Vietnam and Thailand are located in the Central and Southern part of the country. In particular, areas where the highest levels of inflation are observed are rice producing areas and areas located at important border crossings.

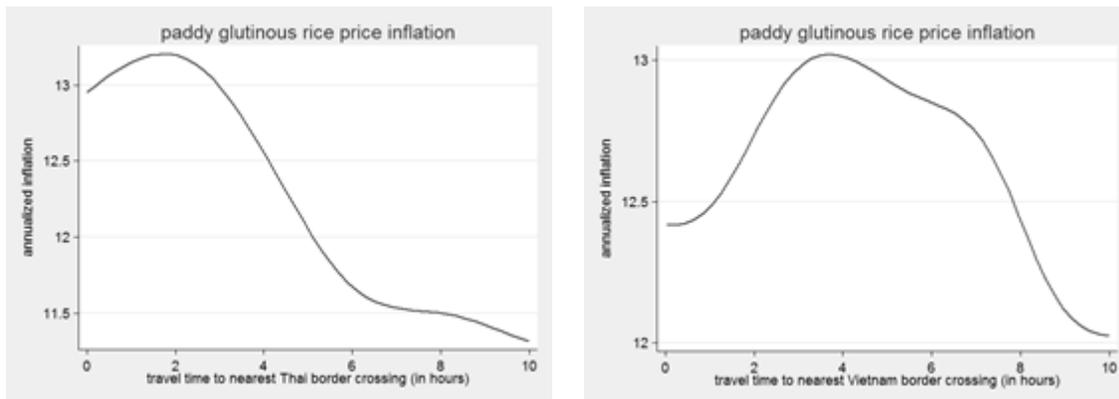
Speculation could thus play some role as it would then be as a response to anticipated regional supply shocks. Further study is needed to disentangle their importance.

cause of Lao price spikes, but volatility in Thai production may be the original cause.

Market information suggests large commercial exports to Vietnam

One striking piece of evidence comes from market information directly obtained from traders. Millers and retailers were interviewed in three major rice-producing provinces, Champasak, Savannakhet and Khammouane. They all exported large quantities of rice to Vietnam after the 2009 October-November harvest. Millers also exported

Figure 11: Proximity to Thai border results in higher paddy price inflation



Source: Staff estimates based on LECS3 and LECS4.

The graphs show average annual glutinous paddy inflation from 2003-2008 plotted against distance measured in hours of travel time to nearest border crossing to Thailand (left) and Vietnam (right). The graphs show that moving away from the Thai border results in almost a 2 percent drop in paddy inflation. The results are significant because it can be shown moving away from provincial capitals would result in less than 1 percent inflation. By contrast inflation peaks at about 4 hours travel distance to Vietnam because glutinous rice is imported from production zones in this distance.

rice to Vietnam during the previous seasons, mostly selling directly to Vietnamese traders. These amounts were substantial; on average about one to three thirds of total milling output. Some retailers had also sold rice to Vietnamese traders, but mostly in small amounts. Government export restrictions imposed in mid-2010 reduced formal exports substantially.

Government actively encouraged exports Vietnam during 2009 to early 2010. Vietnamese traders have been active in Laos for a long time, and the links to Vietnam are strong, both politically and because some households are of Vietnamese origin. To export rice, traders need to obtain an export quota, which is issued by provincial governments. The practice varies across provinces, partly due to local rice surpluses. During the 2009 season it was in general easy to obtain large export quotas, possibly because the harvest was considered large enough to cover domestic needs. The intention of boosting exports to Vietnam

was also reported in newspapers (Vientiane Times, June 2010). It also was mentioned that the government was storing rice to ensure it could meet its export targets. It further stated that according to the Ministry of Agriculture, there is a great deal of informal exports (actual size is unknown), which causes problems for the Ministry of Industry and Commerce in its attempts to manage prices in the domestic market through export regulation.

The strongest evidence for the importance of exports to Vietnam comes from official government trade data. Even though data on official exports of rice to Vietnam may severely underestimate the size of exports, the pattern is striking. Figure 10 shows monthly glutinous rice-price inflation and monthly exports to Vietnam for October 2005 to December 2010, the period for which data are available. Exports have been lagged by

six months to highlight the relationship.¹⁹ Large exports preceded the price increases both in 2006 and in 2010. The time period between exports and price rises are due to the seasonal pattern. After the main harvest in October and November, there is rice available in the market, supported by the much smaller harvest of irrigated rice in April and May, but then prices start to rise in July. Vietnamese demand coincides with celebration of New Year in January or February. It could also be due to the availability of rice after the wet harvest at the end of the year.

Survey data also confirms the importance of trade in price transmission. Map 2 and Figure 11 show the spatial patterns of average annual glutinous rice inflation between 2003 and 2008. Rice inflation has been highest in rice producing areas that reportedly trade with Vietnam and Thailand (Sengua and others, 2009). This coincides with relatively high glutinous rice price increases in both countries during this period. By contrast, average annual inflation is much lower in the Northern part of the country and around Vientiane, the capital of Laos.²⁰

¹⁹ The six-month lag can be explained by the fact that prices rise when there are shortages, not when the rice is sold. While the magnitude of the recorded trade is small, it must be remembered that traded market volumes are small and there is large unrecorded trade.

²⁰ Nevertheless it should be noted that trade is not the only factor explaining this patterns. Further study is needed to distinguish other effects; such for example improved infrastructure investments.

Why glutinous rice from Laos is of interest to Vietnam

There is widespread skepticism about the competitiveness of Laos in the international rice market. Demand for glutinous rice is at best limited to the region, where Thailand and Vietnam, the world's two largest rice exporters are located. In addition, there are claims that poor marketing infrastructure severely limits Laos' overall export competitiveness (see for example ADB, 2006). At the same time, some observers note that there is limited information about the regional glutinous rice market to evaluate this claim.

The rice exported to Vietnam comes from the main rice-growing provinces. Field evidence, as well as spatial survey data documented in Map 2, suggests that Vietnamese traders source their rice from large millers in the main rice-growing provinces. This is also consistent with the findings of Hill and Christiansen (2006) showing that farmers located in districts near the Vietnamese border are less engaged in crop sales than others.

Yet, there is a natural demand for Lao rice in Vietnam for various reasons. One reason why Vietnam imports rice is that Laos is closer to the North of Vietnam than the large rice-producing area, the Mekong delta in the South. As a result of its elongated shape, and the long distance between the North and the South of Vietnam, the Vietnamese rice market is highly segmented (Baulch and others, 2008). The main rice-producing areas in Central and Southern Laos are close and connected with relatively good roads, although the border between Laos and Vietnam is in a mountainous area.²¹ For

²¹ To this should be added that road infrastructure has improved in recent

Figure 12: Lao glutinous paddy is competitive

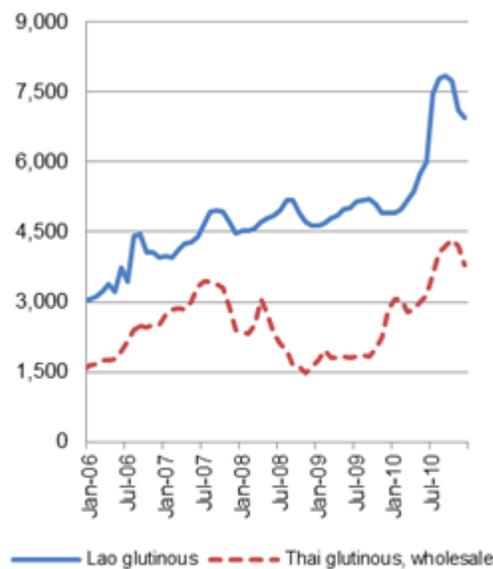
Lao glutinous paddy prices are more competitive than Thai paddy...



Source: Lao Ministry of Industry and Commerce and Thai ministry of Agriculture and Cooperatives.

The graph shows 'farm gate' paddy prices from January 2006 to February 2011 measured in Kip per kg. The Thai prices are converted into Kip using the nominal effective exchange rate.

...but Lao milled glutinous rice prices are more expensive than in Thailand



Source: Lao Ministry of Industry and Commerce and Thai ministry of Agriculture and Cooperatives.

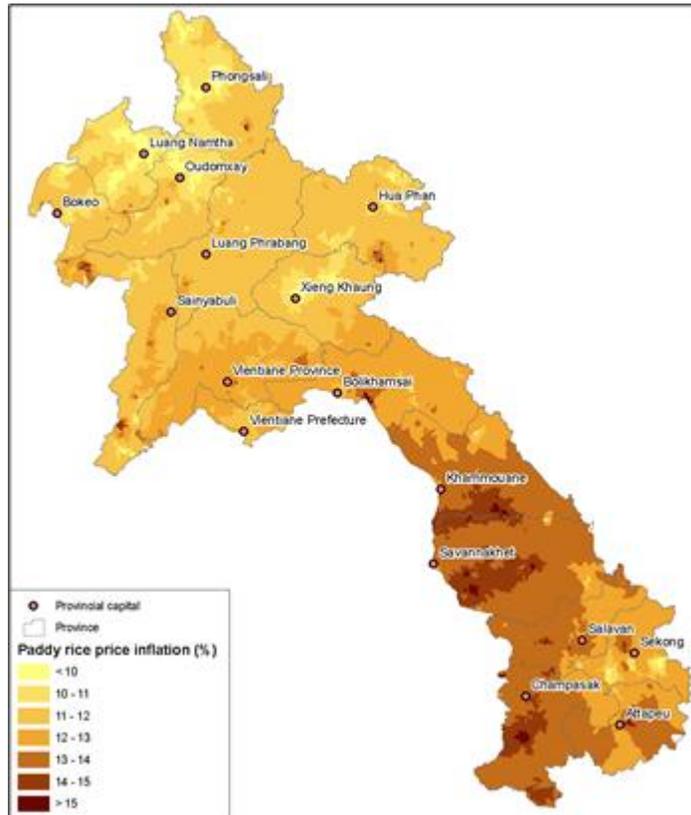
The graph shows retail (Laos first grade) and wholesale (Thailand 10% broken) milled rice prices from January 2006 to December 2010 measured in Kip per kg. The Thai prices are converted into Kip using the nominal effective exchange rate.

instance, it takes only a couple of hours to drive from Thakek, the capital of the province with the largest rice surpluses, Khammuane, to the border town Mu Gip. Moreover, because of close cultural ties and an estimated large number of ethnic Vietnamese or Lao with Vietnamese ancestry, trucks from Vietnam regularly deliver goods to cities in Laos, and back-loading with rice can improve profits compared to returning empty, even when price differences are small.

years, thus facilitating trade flows. In the 2009 crop seasons there was also a damage of the Vietnamese harvest because of a tropical cyclone.

Substantial amounts of glutinous rice are consumed in Vietnam. It is a common view that only people in Laos and the northeast of Thailand consume glutinous rice, and that the market outside this area is almost negligible (Bourdet, 2000). However, although glutinous rice is not the staple food in other East and South East Asian countries, it is consumed on special occasions. In Vietnam, for example, it is used to prepare breakfast meals and sweets, as well as for production of cookies and other products. Demand is particularly high during the Lunar New Year (Tet Nguyen Dan), which always falls in January or February. According to the Vietnamese living standard surveys annual consumption is over five kg per person.

Map 3: Paddy price inflation is highest in areas that trade with Thailand



Source: Staff estimates based on LECS3 and LECS4.

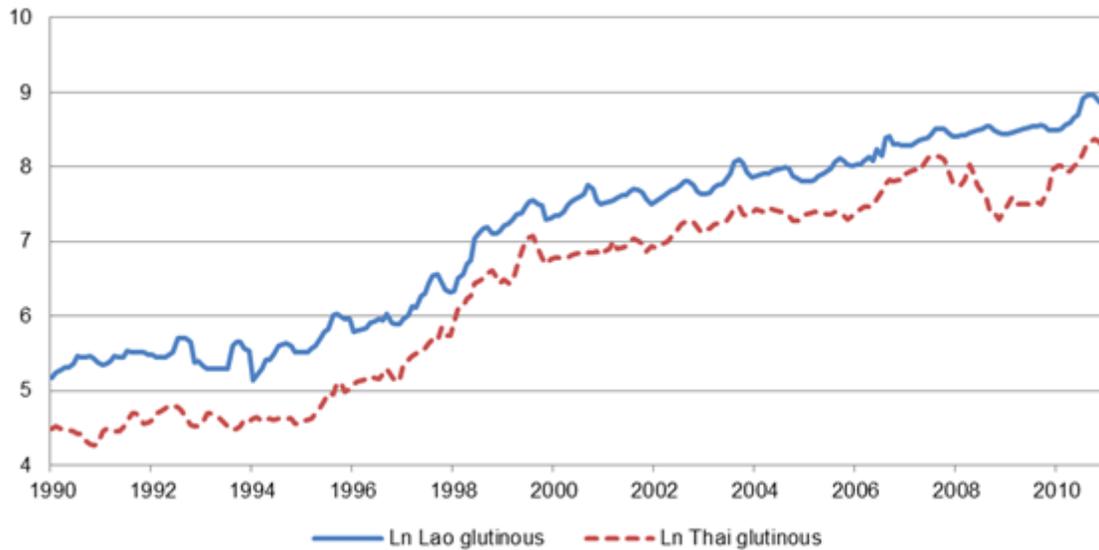
The map shows average annual glutinous paddy inflation over 2003 to 2008. The parts of Laos that are believed to be most active in producing and exporting glutinous rice abroad are located in the Central and Southern part of the country along the border of Thailand. In particular, areas where the highest levels of inflation are observed are the rice producing areas located at important border crossings.

Since there are 86 million Vietnamese, total demand for glutinous rice might have been at some 430,000 tons in 2009. This amount is so large that shortfalls in production, or price differential, should spill over to the Lao market. One must also account for the fact that glutinous rice production reportedly has decreased in Vietnam, as farmers switch to ordinary rice for the export market. Some Lao glutinous rice may also be exported from Vietnam to China, where demand for glutinous rice also exists.

Actual exports to Vietnam are much larger than official exports, though the

actual magnitude is unknown. Borders are porous and export restrictions affect traders. As rice exports drove up prices during 2010, the government tightened up the restrictions on exports. Though some millers have export quotas to Vietnam, and other countries, and there are illegal exports, national export ‘bans’ clearly affect millers. This was observed during the field trip. Several millers had large stocks of rice specifically for the export market. The consequences of the export restrictions have also been reported in the media (Vientiane Times, March 2011): millers’ inability to export leads to losses

Figure 13: Lao and Thai glutinous rice prices share the same long-run trend



Source: Lao National Statistical Bureau and Thai Ministry of Agriculture and Cooperatives.

The graph shows the natural logarithm of retail (Lao first grade) and wholesale (Thai 10% broken) milled rice prices from January 1990 to December 2010 measured in Kip per kg.

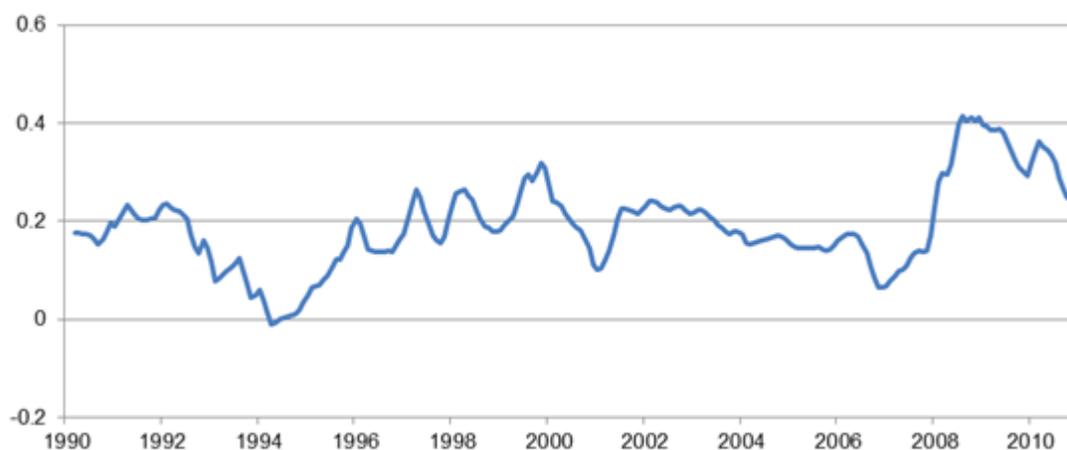
as domestic prices are low relative to what they paid for the paddy.

The reason for large sudden exports to Vietnam is the availability of export quotas. They typically reflect good harvests in Laos. The two periods with large price increases coincide with large official exports to Vietnam. The procedure of distributing export quotas to millers and traders is not transparent. Both the central government and provincial governments are involved. However, official data on harvests for 2005 and 2009 indicate that they were larger than previous years. Hence, it is likely that part of the surges in exports to Vietnam can be attributed to Lao trade policy implemented at the national and provincial level.

Paddy trade with Thailand is mostly undocumented

A large part of the trade with Thailand consists of informal cross-border exports of paddy, and reported re-imports of milled high-quality rice. A long stretch of the border between Laos and Thailand is made up of the Mekong River, and paddy rice can easily and informally be transported to Thailand. There are several reasons why it might be profitable to export paddy to Thailand. First, Thailand has minimum prices, which often are higher than Lao prices. Second, milling is more efficient and recovery rates are higher. It is estimated that well over 60 percent of the paddy is recovered in Thailand while many mills in Laos recover close to 50 percent. Third, Thailand has excess capacity in the milling sector (Bangkok Post, November

Figure 14: Short-run correlation between Thai and Lao glutinous rice prices varies over time and reached a historical peak in 2006-2008



Source: Staff estimates based on Lao National Statistical Bureau and Thai Ministry of Agriculture and Cooperatives.

The graph shows time-varying correlation between the volatility of Thai and Lao first grade glutinous rice prices from March 1990 to December 2010. The 'rolling estimates' are based on an autoregressive econometric model documented in the annex. The short-run correlation explains on average about 20 percent of price transmission. During 2008-2010 market linkages have intensified as short-run correlation explains more than 40 percent of price transmission.

2010). Fourth, Lao rice can be re-exported back to Laos as Thai rice, and fetch a higher price than Lao rice.

There is no reliable information about the size of exports to Thailand. But in 2010 prices rose in both Laos and Thailand. Figure 12 shows that Thai and Lao prices of glutinous paddy, measured in Kip per kg, followed each other fairly well from January 2006 to February 2011. In particular, the 2010 price hike and decline first occurred in Thailand. Prices started to rise somewhat earlier there and rose to a higher level. Figure 12 also compares Lao retail prices of glutinous rice (grade 1) with Thai long grain (10 percent broken) glutinous rice wholesale prices, also measured in Kip per kg. The decline in Thai prices in 2007 and 2008 did not transmit to Laos. Although the prices reported might not be for exactly the same type of good, a striking feature is that Lao paddy prices are typically cheaper than Thai paddy prices. By

contrast, Lao milled glutinous rice is significantly more expensive than Thai milled glutinous rice. Consequently, there is a strong incentive to export paddy to Thailand as documented in Map 3. It also shows that average annual inflation from 2003 to 2008 has been highest in paddy producing areas that trade with Thailand. Inflation has been particularly high around major border crossings.

In the long run, Lao and Thai glutinous rice prices have the same trend. This is best illustrated by graphing the glutinous rice price series in logarithmic scale.²² Figure 13 illustrates that the Lao and Thai glutinous rice prices share the same long-run trend. A formal test indeed indicates that both price series are co-

²² Using logs highlights the long-run relationship, as constant growth rates are turned into linear growth rates.

integrated.²³ In the long run about 90 percent of the price changes in Thailand are transmitted to Laos (see also Annex). These findings are robust in the sense that using different price series does not affect the results. These findings can also be confirmed with glutinous paddy prices.

Thai glutinous rice prices determine Lao prices in the long run. Thai prices, which should reflect regional market prices, determine Lao prices in the long run. In 2009, Thailand produced an estimated 6 million ton of glutinous rice and exported about 450,000 tons. Laos' total rice harvest (including non-glutinous rice) is slightly over 3 million ton, out of which most was for self-consumption. It is thus reasonable to believe that Thai prices influence Lao prices, and not vice versa. In fact, formal statistical analysis confirms these findings. In a statistical sense Thai prices indeed cause Lao prices (see Annex). Moreover, price transmission is found to be asymmetric. Glutinous rice price increases are transmitted much more rapidly than price decreases (Figure 7). It is also reasonable to believe that Thai prices reflect regional (East Asian) prices of glutinous rice, but further study of regional rice markets is warranted. The link with Thai prices thus severely limits the Lao government's ability to manage prices over periods of a couple of years.

In the short-run, the percentage difference between Lao and Thai glutinous rice prices varies a great deal. The short-run correlation in price volatility is on average 0.2. But Figure 14

²³ The Engle-Granger co-integration test statistic is -3.9 and close to be significant at the one percent level. The long-run relationship between the log of Lao and Thai prices is $\ln P_{Lao} = 1.27 + 0.91 \ln P_{Thai}$, $R^2 = 0.98$.

shows that there are several shifts from plus 0.4 to almost zero. The period 2008 to 2010 was particularly volatile; probably because of the aftermath of the first global food crisis, several government interventions in rice markets, and the following financial crisis. In particular, Thai government guaranteed high minimum prices for paddy in 2008 even though food prices were already high.²⁴

To conclude, the available empirical evidence points to international trade as the main proximate cause for high glutinous rice price inflation. But due to knowledge gaps about the functioning of the rice market, many the details about the price transmission mechanisms are largely unexplored. Lao glutinous rice prices are determined by regional supply and demand, at least when viewed over the period 1990 to 2010. Higher glutinous rice prices in Vietnam most likely lead large exports,²⁵ and there is a strong link between Lao and Thai prices through paddy exports, and re-imports of milled glutinous rice, though price changes are often volatile and at times transmitted slowly. Nonetheless, the knowledge of how the regional market for glutinous rice works is sketchy. From a policy perspective there is a need to analyze regional price transmission mechanisms

²⁴ An attempt was made to prevent paddy from entering into Thailand from Laos. Thailand itself did not impose trade restrictions.

²⁵ Information about glutinous rice prices for Northern Vietnam markets is available, and market information and some price data for 2009 to 2010 confirm these findings.

further, particularly since Laos plans to trade rice freely in 2015 within the Association of Southeast Asian Nations (ASEAN) free trade area.²⁶ Under these arrangements Laos is in principle obliged to drop its current import tariff on rice from other ASEAN countries from 5 percent to zero in 2015. The applied rate is the same for both paddy and milled rice. Vietnam will do the same; Thailand already reduced the tariff on rice to zero in 2010. Formal cross-border rice trade may thus increase over time.

6. CONCLUSIONS AND RECOMMENDATIONS

The objective of this note was to identify lessons for policy from the recent glutinous rice price hike. Price fluctuations are a normal attribute and necessary requisite for a competitive market. When a commodity becomes scarce its price rises, which induces a fall in consumption, and eventually more investment in production. But the efficiency of the price system can break down when price movements are subject to extreme swings. Understandably, the main rationale for policy intervention is often market failure and addressing potentially negative welfare implications.

²⁶ One possibility is that trade to Vietnam may drive short-term Lao rice price inflation, whereas Thai trade drives medium to long-run developments. This suggests that the government does not have much control over domestic market prices. Price interventions will thus not be an effective policy instrument.

The main findings can be summarized as follows:

- *Traditional supply and demand factors can explain only a small part of the 2010 glutinous rice price inflation. Domestic rice supply shocks might only to a limited extent have contributed to sudden rice inflation. Nevertheless, there is some uncertainty about aggregate production data. One can effectively discount a large role of seasonality effects, decreases in marketed shares of the harvest, and increases in aggregate demand in explaining rice inflation. Increased credit supply and hoarding can also be ruled out as major drivers of rice price inflation.*
- *Regional trade appears as the main proximate cause for high glutinous rice prices. Large official rice exports to Vietnam preceded the price jumps both in 2006 and 2010. Rice inflation has been highest in areas that trade with Vietnam and Thailand. Vietnam trade seems to drive short-run price fluctuations in particular whereas trade to Thailand drives medium to long-run rice inflation. There appears to be a strong incentive to export milled rice to Vietnam and paddy to Thailand.*
- *Future analysis should look closer at the role of regional supply shocks for the determination of glutinous rice prices. In principle, it is possible that major supply shocks are regional. They could thus affect Laos, Thailand and Vietnam simultaneously. Speculation could play a role, as it could be as a response to anticipated regional supply shocks. Trade could be thus a likely proximate cause of Lao price spikes, but volatility in Thai and*

Vietnamese production—and other factors explaining prices in neighboring countries—may be the original cause. Future analysis should look at Thai and Vietnamese glutinous rice production trends and analyze to what extent they can explain Lao price volatility.

- *Glutinous rice price increases may have been reinforced by ad hoc trade policy decisions.* The fact that periods of large rice price hikes coincide with large official exports to Vietnam is also attributed to ad hoc national and provincial trade policy decisions, which are temporarily favoring exports, but then reverse and restrict exports.
- *In Laos, high rice prices tend to have marginally overall positive welfare impacts.* In particular, rural rice farmers in major rice producing regions gain from rice increases. High prices also present an opportunity to stimulate production and enhance the role of rice for economic growth and rural poverty reduction. Higher rice prices can also help induce private sector and donor investment in the Laotian rice sector, especially in the milling sector which is rather outdated.
- *There is an important regional niche market for Lao glutinous rice.* Consequently there is substantial trade to neighboring countries. Glutinous rice production in Laos appears to be marginally competitive at the regional level, possibly due to specific market characteristics. Regional glutinous rice trade flows with the two major rice producing giants Vietnam and Thailand are not a threat, but should be interpreted as a major opportunity.

Against this background, it appears that current price interventions may not be effective. At best, the overall impact and efficiency of current policy responses are uncertain. Apart from an ongoing general policy of increasing domestic rice production, the government response to the glutinous price hike has three components: (i) export restrictions, (ii) interventions to increase rice stocks and maintain strategic reserves, and (iii) plans to eventually implement price controls (Lao PDR, 2010). These measures are likely to have an uncertain impact on the rice market, largely because of lack of accurate information on production volumes, stocks, trade flows etc.

International experience indicates that trade restrictions, government storage and price controls might have inadvertently exasperated price volatilities, rather than limit it. Evidence from Sub-Saharan Africa shows that countries with relatively open and transparent trade and marketing policies, such as Mozambique and Uganda, had the lowest price variability. But countries that intervened regularly in a discretionary manner, such as Malawi and Zambia, had the highest price volatility. The use of discretionary policy, which is inherently unpredictable, actively discourages production and trade. Moreover, in countries with few ad hoc interventions, such as Uganda, maize production grew rapidly, while it grew slowly in Malawi and Zambia (Chapoto and Jayne, 2010; Jayne and others, 2010). For Laos, market-friendly forward-looking actions to manage price risks could include:

- *Develop and implement a rice sector policy framework.* The current high rice prices levels are an opportunity for rice sector development. Laos is a small economy and strengthening the

rice sector is crucial. But Laos appears as one of the few countries in the region that does not have an operational rice sector strategy to fully develop its potential. The development of a policy framework could help to establish principles for production, commercialization, and trade policy decisions, and better coordinate Government and donor funding for the sector. An important element would be to better coordinate policy decisions at the national, provincial and district levels, and address knowledge gaps. The strategy should also be coordinated with national agricultural growth and regional trade liberalization objectives.

- *Better understand the regional market of glutinous rice in order to enhance implementation effectiveness of domestic policy measures.* Estimates of actual cross-border trade flows between countries and characteristics of the regional glutinous rice market, including primary data collection on prices and trade flows, would be a useful first step. Relaxation of controls and provision of market access to farming communities could make Laos a net exporter of rice over and above just having a small incremental niche-market. Altogether, prudent trade and stock policies in Laos are hard to formulate and implement without such are regional market analysis. Currently none of such knowledge is available.
- *Restrain from intervening into the market mechanisms in the short-run.* This is because households appear to gain on average from higher rice prices. However, some short-run

measures may be warranted to address adverse distributional impacts of rice price inflation, targeted at poor households living in urban and food-deficit areas. An important option would be to consider expanding social safety nets programs in Laos, such as food for work programs (World Bank, 2009). Safety net programs would also help address the risks stemming from supply shocks and in the long run deal with climate change issues.

- *Continue to enhance national rice production in the long-run through public and private investments in the sector.* Achieving higher production targets and marketable surplus is in particular important in the light of high population growth, which is the main long-run determinant of rice consumption. With the Lao population growing at 2.2 percent per year, the demand for rice is expected to grow substantially over time, requiring substantial yield and production increases. Moreover, still not all households are able to permanently meet their rice consumption requirements. Enhancing national production requires systematically identifying and addressing bottlenecks for rice sector development. It also requires carefully prioritizing development needs and enabling donor coordination. The proposed rice sector policy framework would be a useful first step to initiate a comprehensive rice development program in Laos.
- *Establish an effective rice price monitoring system, which tracks both domestic and regional price, production and trade trends.* Better information is necessary because

there is little information to guide the policy makers on carrying out evidence-based market interventions in Laos. There is paucity of information about the production volumes, stocks in storage, formal and informal trade, and prices. All these information shortages hamper evidence-based policy interventions.

- *Be aware of long-run macroeconomic implications.* There is a need to better understand how world food and energy prices affect price trends in Laos and in the region. Consumer price developments in Thailand and Vietnam can have significant impact on prices in Laos through price transmission. Rice and food price increases can eventually feed into domestic wages. And expectations can create inflationary pressures over time. Moreover, current price inflation is taking place in the context of already high private credit growth, which itself can contribute to inflationary pressures. All this justifies comprehensive monitoring of food price trends in Laos.

TECHNICAL ANNEX

Data sources

Lao rice price data were obtained from government agencies, complemented and verified with historical price data collected by the World Bank Lao country office, FAO and WFP staff, as well as information gathered by several researchers over time. The National Statistical Bureau and the Ministry of Industry and Commerce both collect price data. Data from the National Statistical Bureau is deemed more reliable, because of the Bureau's more rigorous approach in generating the data. Meanwhile, data from the Ministry of Industry and Commerce are mainly collected for policy monitoring purposes and publicly released, unlike the price data sourced from the National Statistical Bureau.

Price information shows quality shifts at times and there are different time-series with slight revisions and outliers. Overall data management quality is poor. Despite these differences, prices seem to reasonably reflect market conditions. Household data are from the 2003 LECS3 and 2008 LECS4 (Lao Expenditure and Consumption Surveys). The spatial data are from the Swiss-funded DECIDE project and mainly based on the 2005 Population and Household Census.²⁷ Formal trade flows are from the Ministry of Industry and Commerce. Data was crosschecked with qualitative evidence from field visits, several reports, discussions with government officials and the donor community.

²⁷ See <http://www.decide.la> for details.

Overview of rice sector studies

Detailed studies on the Lao rice sector are scarce. This leads to a notion of a lack of reliable evidence of the functioning of the rice market. The few available reports, sometimes presentations, are often outdated or show conflicting findings.

One of the most comprehensive pieces is from Schiller and others (2006). The book mainly discusses agro-economic, social and anthropological issues of the rice sector.

Moreover, quantitative evidence and technical analysis especially on the functioning of the rice market are likewise sparse. Majority of statistical and empirical evidence are obtained from unpublished reports. The key source of data is a rapid assessment survey from 2008 technically and financially supported by the Food and Agricultural Organization of the United Nations (FAO/MAF, 2009). It presents rice sector statistics in the form presentational slides. Sengua et al (2009) employ such data along with other market information to provide a snapshot of the rice market. Another comprehensive analysis using actual rice price and production data is Bourdet (2000).

The question of market integration has received some attention from several papers (van der Weide, 2006; Andersson et al, 2007; Takamatsu, 2002). Nonetheless, the findings of these studies are generally inconclusive and rarely address regional trade with neighboring countries. Market commercialization related to poverty and welfare is analyzed by Hill and Christiaensen (2006). Several studies tackle broader institutional and policy questions. These include an evaluation synthesis by the ADB (2006) and two consultant reports commissioned by the World Bank (EMC, 2011 and GSD, 2005).

Table 2: First-order household welfare impacts of rice inflation

Region	Household production and consumption (in percent)			Estimated welfare impact (Dec 2009 to Dec 2010)
	Production ratio	Consumption ratio	Net sales of rice	First-order household welfare impact
	(PR)	(CR)	(NBR)	(in percent of initial household income)
Vientiane	22.5	16.3	6.2	2.5
North	31.8	32.2	-0.4	-0.1
Central	39.0	31.6	7.3	3.0
South	32.7	32.2	0.6	0.2
Total	33.6	30.3	3.3	1.4

Source: LECS4 data based on Davis and Baulch (2011) and staff calculations.

Welfare impacts of rice inflation

The seminal work of Deaton (1997) provides the methodological framework to estimate the short-run welfare impact of price changes. Rice price changes are proportional to the net benefit ratio (NBR). The net benefit ratio can be interpreted as the elasticity of real income with respect to price change. This ratio is the difference between the household production and consumption ratio:

$$\Delta w_i = \Delta p (PR_i - CR_i)$$

where Δw is the welfare effect expressed as percentage of original incomes of the household i , Δp is the percentage change of rice prices; PR is the rice production ratio; and CR is the rice expenditure ratio. Production and consumption data are from LECS4, using shares calculated by Davis and Baulch (2011). The total change of in relative rice prices from December 2009 to December 2010 is 40.6

percent. The findings are summarized in Tables 2 and 1 (main text):

(1) The overall average net welfare impacts of the increase in rice prices is marginally positive. The exception is the Northern region where, on average, increases in rice prices lead to a slight decline in household welfare.

(2) Looking beyond averages, welfare effects seem to vary significantly by region and proximity to rice-producing areas in the Central and Southern provinces. The adverse impact of rice price hikes is moderate in urban households but is significant in remote rural households in the food-deficient Northern provinces are significantly negatively affected by a rice price increase. Areas where households produce rice surpluses generally gain from price increases.

These calculations only approximate short-run welfare impacts, as the analysis does not capture second-order effects stemming from induced wage response.

Table 3: Transmission of glutinous rice prices between Laos and Thailand

	$\Delta \log(p_{Laos,t})$		$\Delta \log(p_{Thai,t})$	
	symmetric	asymmetric	symmetric	asymmetric
ECT_{t-1}	-0.113*** (0.027)		0.053** (0.026)	
ECT_{t-1}^+		-0.067 (0.042)		0.055 (0.041)
ECT_{t-1}^-		-0.188*** (0.059)		0.048 (0.057)
$\Delta \log(p_{Laos,t-1})$	0.205*** (0.061)	0.211*** (0.061)	0.020 (0.059)	0.020 (0.059)
$\Delta \log(p_{Thai,t-1})$	0.129* (0.066)	0.122* (0.066)	0.401*** (0.063)	0.0401*** (0.064)
Constant	0.009** (0.004)	0.002 (0.007)	0.008** (0.004)	0.008 (0.007)
Co-integrating vector	(1, -0.912)		(1, -0.912)	

*, **, *** denotes significance at 10, 5, 1 percent level.

Due to data unavailability, these estimates do not account for the possibility of inflation differentials between rural and urban locations, or inflation differentials between household income groups. Despite these shortcomings, the overall findings are consistent with rice inflation analysis undertaken for Vietnam (Minot and Goletti, 2000; Glewe and Vu, 2009) and analysis for Laos during the global food crisis in 2006 to 2008 (World Bank, 2009; Takamatsu, 2011).

Spatial patterns of rice inflation

All maps presented in this report display a continuous variation across space. The spatial price data are created from the 2003 LECS3 and 2008 LECS4 household surveys. As there are only observations

for a selected number of villages and towns, the maps are generated through spatial smoothing. The data y is on n different locations, which allows estimating y for each of the 10,035 villages and towns by a spatially weighted average over the n locations. The greatest weight is given to observations closest to the village for which the missing data are imputed with the following formula:

$$\hat{y}_i = \sum_{j=1}^{i=n} w_{ij} y_j$$

The weights sum up to 1, and decline as the travel time between i and j increases. There are no observations of the routes most popularly travelled between locations. Therefore routes are

estimated by minimizing the travel time over all possible routes. After some experimentation, the final weights in the spatial smoothing regression equals the inverse of the travel time to the power 1.5 which balances the trade-off between averaging sampling errors across n observations, and maintaining as much of the spatial variation in the underlying variable as possible.

Asymmetric rice price transmission between Laos and Thailand

The regression is done with glutinous rice prices from January 1990 to December 2010 using data from the Lao and Thai national statistical offices. Thai prices are converted to Kip using the nominal effective exchange rate. An Augmented Dickey-Fuller (ADF) unit root test confirms that the price series in both the Lao and the Thai market are integrated of order one, I(1). The estimated baseline error correction model with symmetric adjustments to equilibrium has the following form:

$$\begin{aligned}\Delta \log(p_{Lao,t}) = & c + \rho ECT_{t-1} \\ & + \delta_{Lao} \Delta \log(p_{Lao,t-1}) \\ & + \delta_{Lao} \Delta \log(p_{Thai,t-1}) \\ & + u_t\end{aligned}$$

Following Enders and Siklos (2001), incorporating asymmetric threshold adjustments to equilibrium, the error-correction model becomes:

$$\begin{aligned}\Delta \log(p_{Lao,t}) = & c + \rho^+ ECT_{t-1}^+ \\ & + \rho^- ECT_{t-1}^- \\ & + \delta_{Lao} \Delta \log(p_{Lao,t-1}) \\ & + \delta_{Lao} \Delta \log(p_{Thai,t-1}) \\ & + u_t\end{aligned}$$

For the asymmetric model the threshold value is set at zero. Price data are too limited to estimate a three-regime model, which would have allowed the identification of a transaction cost effect, in addition to the standard asymmetric adjustment effect. Table 3 presents the results, suggesting the following:

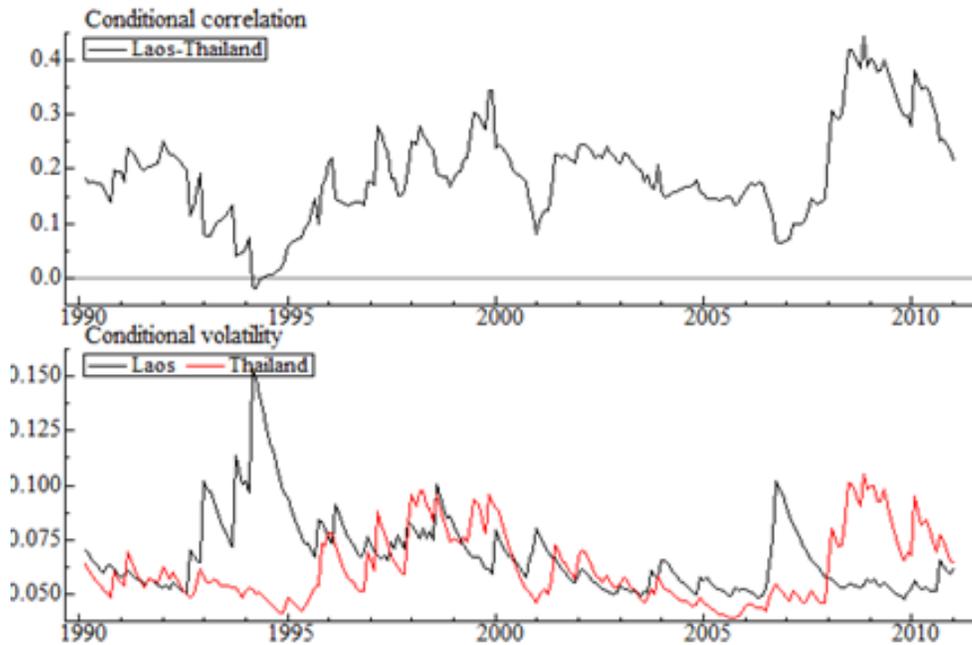
(1) Thai glutinous rice prices Granger-cause Lao rice prices, suggesting that Thailand is the regional price setter. Also a separate Granger causality test assuming two lags confirms this finding ($p < 0.001$).

(2) The Lao and Thai glutinous rice markets are co-integrated close to the one-percent level. In the long run there is almost perfect price transmission. A one percent increase of Thai prices increase Lao prices by 0.91 percent.

(3) Glutinous rice price transmission from Thailand to Laos is asymmetric. Adjustments following negative price deviations from the long-run equilibrium (high Thai prices) are faster than adjustments following positive price deviations (low Thai prices). The sign of the error-correction terms (ECT) have the expected opposite signs. They are negative for the Lao model, and positive for the Thai model. This is because when Lao prices experience a negative deviation from equilibrium, Thai prices experience a positive deviation from equilibrium, and vice versa.

Overall, the results for Lao are consistent with findings on food commodity price transmissions in developing countries. Examples are rice price transmission between Nepal and India (Sanago and Amadou, 2010) and spatial price transmission in the Ghanaian maize market (Abdulai, 2000).

Figure 15: Monthly time variation in conditional correlation and volatility between Lao and Thai glutinous rice prices



Volatility analysis between Lao and Thai rice prices

Short-run price dynamics are analyzed by the means of generalized orthogonal generalized autoregressive conditional heteroskedasticity (GO-GARCH) model. The regression is done with glutinous rice prices from January 1990 to February 2011 using data from the Lao and Thai Statistical Offices to estimate the model parameters (by means of maximum likelihood). The model is particularly suited to provide a volatility measure that can be used to understand the time-varying linkage between price changes in the two markets, and the transmission of volatility from one market to the other.

The data used for the estimation was first cleaned for first order auto-correlation. Following the approach put

forward by van der Weide (2002) and Boswijk and van der Weide (2011), the multivariate model has the following form:

$$x_t = Zu_t$$

where Z denotes a non-singular matrix that links the observed data x (which is the bivariate time series cleaned from first order auto-correlation) and the latent bivariate process u that consists of two uncorrelated factors, each with expectation zero and conditional variance following a GARCH (1,1) dynamics:

$$h_{i,t} = c + \alpha u_{i,t-1} + \beta h_{i,t-1}$$

with $i = 1,2$

The GARCH (1,1) approach is often considered as the simplest and most robust of the family of volatility models. The main results of the analysis are

plotted in Figure 15. The following observations emerge:

(1) The volatilities of Lao and Thai rice prices move in tandem in normal times, but not in abnormal times. Shocks that lead to spikes in volatility do not spread across the two markets. An example is the recent surge in Thai rice price volatility in 2010, while Lao volatility is low. The exact opposite occurred two years earlier in 2007.

(2) Using conditional correlation as a proxy, one can see that the linkages between Lao and Thai rice markets have intensified significantly. In particular, the

price data suggests that correlations have intensified since 2007.

(3) A possible explanation why correlation rises in 2007, while volatility is not transmitted, could be market interventions implemented by the government. In particular, after pressure from farmers, Thailand started setting high minimum paddy prices in the middle of 2008 and simultaneously prevented rice imports from neighboring countries, including from Laos.

REFERENCES

- Abdulai, A. 2000. "Spatial Price Transmission and Asymmetry in the Ghanaian Maize Market." *Journal of Development Economics* 63: 327-349.
- ADB. 2006. *Lao PDR: An Evaluation Synthesis on Rice*. Operations Evaluation Department. Manila: Asian Development Bank.
- Alvesson, H., N. Kiso and J. Rigolini. 2008. *Implications of Higher International Food Prices in Lao PDR*. Washington DC: World Bank. Processed draft.
- Andersson, M. A. Engvall, and A. Kokko, 2007. "Regional Development in Lao PDR: Growth Patterns and Market Integration." *Stockholm School of Economics Working Paper* 234.
- Baffes, J. "More on the Energy/Non-Energy Price Link." *Applied Economics Letters* 17(16): 1555-58.
- Baulch, B., H. Hansen, L.D. Trung, and T.N. Minh Tam. 2008. "The Spatial Integration of Paddy Markets in Vietnam." *Journal of Agricultural Economics* 59: 271-295.
- Boswijk P. and R. van der Weide. 2011. "Methods of Moments Estimation of GO-GARCH Models." *Journal of Econometrics*, forthcoming.
- Bourdet, Y. 2000. "Emerging Rice Market in Laos?" *Country Economic Report*. Swedish International Development Agency: Stockholm. Processed.
- Brahmbhatt, M. and L. Christiaensen. 2008. *Rising Food Prices in East Asia: Challenges and Policy Options*. Washington DC: World Bank. Processed.
- Chapoto, A. and T.S. Jayne. 2010. "Maize Price Instability in Eastern and Southern Africa: The Impact of Trade Barriers and Market Interventions. Prepared for the COMESA policy seminar on "Variation in staple food prices: Causes, consequence, and policy options", Maputo, Mozambique, 25-26 January 2010 under the African Agricultural Markets Program. Ann Arbor: Michigan State University.
- Davis C. and B. Baulch. 2011. *Analyzing the Distributional Effects of Food Price Changes*. Presentation, March 2011. Vientiane: Prosperity Initiative. Processed.
- Deaton, A. 1997. *The Analysis of Household Surveys: A Microeconomic Approach to Development*. Washington DC: World Bank and John Hopkins University Press.
- EMC. 2011. *Lao PDR Rice Sector Scoping and Design Study of Lao PDR SME Development in Selected Agriculture Sub-sectors and Value Chains*. Presentation, January 2011. Vientiane: Emerging Market Consultants. Processed.
- Enders, W. and P.L. Siklos. 2001. "Co-integration and threshold adjustment." *Journal of Business and Economic Statistics* 19: 166-176.
- FAO. 2011. *Global food price monitor* (March 2011). Rome: Food and Agricultural Organization of the United Nations.
- FAO/WFP. 2011. *Special Report: Crop and Food Security Assessment Mission to Lao People's Democratic Republic*. Rome: Food and Agricultural Organization of the United Nations and World Food Program. Processed.

- Fenton, N. and M. Lindelow. 2010. *Lao PDR Development Report 2010: Natural Resource Management for Sustainable Development*. Vientiane: World Bank. Processed.
- Frankel, J. 2006. "The Effect of Monetary Policy on Real Commodity Prices." *NBER Working Paper* 12713. Cambridge, MA: National Bureau of Economic Research.
- GSD. 2005. *Integrated Value Chain Analysis of Selected Strategic Sectors in Lao People's Democratic Republic*. Consultant report prepared for the World Bank. Vientiane: Global Development Solutions. Processed.
- Hill, R.V. and L. Christiaensen. 2006. *Linking Laotian Farmers to Markets*. Washington DC: World Bank. Processed.
- IMF. 2011. *Lao People's Democratic Republic: Staff Report and Public Information Notice*. IMF Country Report 11/44. Washington DC: International Monetary Fund.
- Jayne, T.S., N.M. Mason, R.J. Myers, R.J. Ferris, N. John, D. Mather, M. Beaver, N. Lenski, A. Chapoto, D. Boughton. 2010. "Patterns and Trends in Food Staples Markets in Eastern and Southern Africa." *International Development Working Paper* 104. Ann Arbor: Michigan State University.
- Lao PDR. 2010. *Decree on the control of prices of goods and services*. Prime Minister's Office. Decree 474/PM. Vientiane: Processed (English translation by World Bank).
- Martin, A. and K. Anderson. 2011. "Export restrictions and price insulation during commodity price booms." *World Bank Policy Research Working Paper* 5645. Washington DC.
- Minot, N. and F. Goletti. 2000. "Rice Market Liberalization and Poverty in Vietnam." *International Food Policy Research Institute Research Report* 114. Washington DC.
- Sanogo I. and M. Amadou. 2010. "Rice Market Integration and Food Security in Nepal: The role of cross-border trade with India." *Food Policy* 35: 312-322.
- Schiller, J.M., Chanphengxay, B. Linqvist, and S. Appa Rao (eds). 2006. *Rice in Laos*. Los Baños (Phillipines): International Rice Research Institute.
- FAO/MAF. 2009. *Rice Assessment Survey*. Vientiane: Food and Agriculture Organization of the United Nations and Ministry of Agriculture and Forestry. Processed.
- Sengua, P. V. Manivong, S. Xayachack, S. Sayavong. 2009. *Rapid Assessment of Stocks and Marketing System of Paddy and Rice in Lao PDR*. Vientiane: Food and Agriculture Organization of the United Nations and National Agriculture and Forestry Research Institute. Processed.
- Shimelse A. and V. Eidelman. 2011. "The Surge in Food Prices: What's Different This Time?" *International Economic Bulletin* (April 21). Washington DC: Carnegie Endowment for International Peace.
- Takamatsu, S. 2002. *Economic Analysis of Rice Market Integration in Laos*. Master thesis. Kobe University: Graduate School of International Cooperation Studies.

- Takamatsu, S. 2011. *Impacts of the Global Food Price Crisis on Household Welfare and Poverty in Lao PDR*. University of Minnesota: Department of Applied Economics. Processed.
- van der Weide, R. 2002. "GO-GARCH: A Multivariate Generalized Orthogonal GARCH Model." *Journal of Applied Econometrics* 17 (5): 549-564.
- van der Weide, R. 2006. *The Variation in Prices in Various Commodities in Lao PDR. Background paper for the Lao Poverty Assessment*. Washington DC: World Bank.
- Vu, L.H. and P.W. Glewe. 2009. "Impacts of Rising Food Prices on Poverty and Welfare in Vietnam. *Working Paper 13*." Hanoi: Development and Policies Research Center.
- WFP. 2007. *Lao PDR: Comprehensive Food Security and Vulnerability Analysis*. World Food Programme: Rome.
- World Bank. 2009. *Vulnerability and Safety Nets in Lao PDR*. Vientiane: World Bank. Processed.
- World Bank. 2011. *Food Price Watch (April 21)*. Poverty Reduction and Economic Management Network. Washington DC: World Bank.

Lao People's Democratic Republic
RESPONDING TO RICE PRICE INFLATION

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